# LCD-Monitor

| Chassis | Model |
|---|---|
| LS17PEA | 732N |
| | 732NPLUS |
| LS19PEB | 932B |
| | 932BPLUS |
| LS19PEA | 932NPLUS |

# SERVICE Manual

## TFT-LCD Monitor

## Fashion Feature

-Lustrous/Colorful Appearance (Design)
-Integrated UI applied
-Built-in Scaler Sync Separator
-Connectivity :
LS17PEA, LS19PEA - Analog (15p Dsub)
LS19PEB - Analog (15p Dsub),
Dual (24p DVI-D)
-Power Consumption : 17"(34W), 19"(38W)
-DPMS : under 1 W (230Vac)

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LS17PEA/LS19PEA/LS19PEB Service Manual

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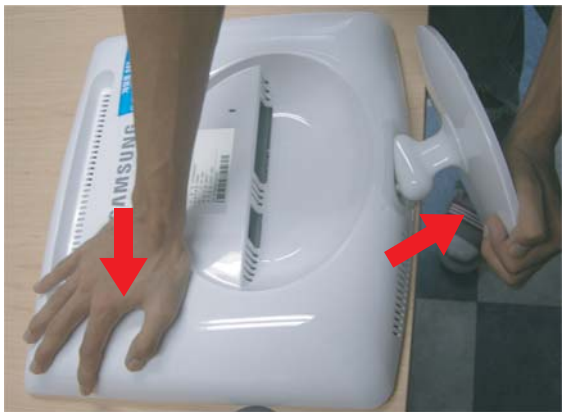
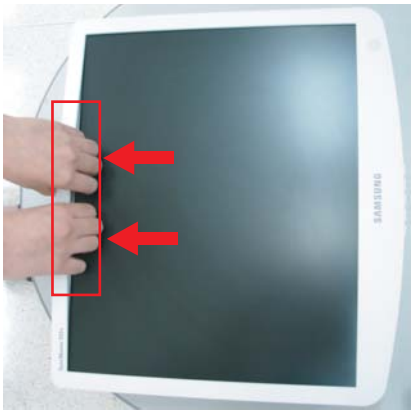
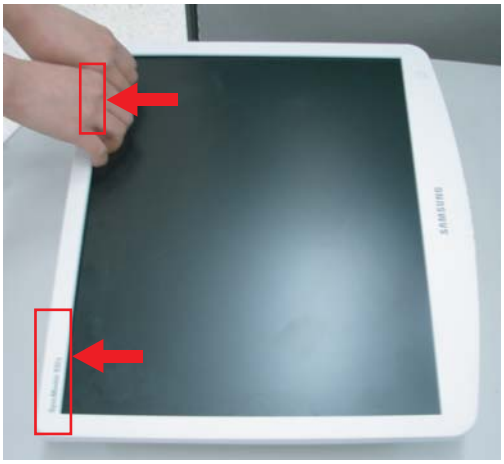
# 11 Disassembly and Reassembly

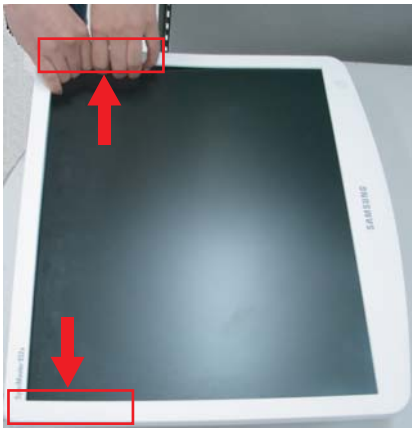
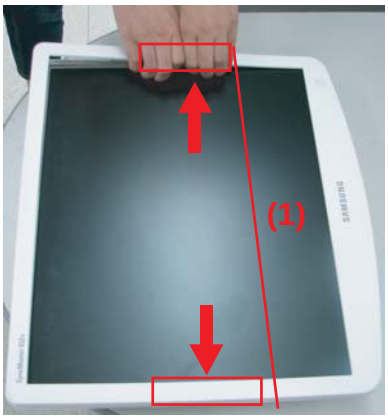
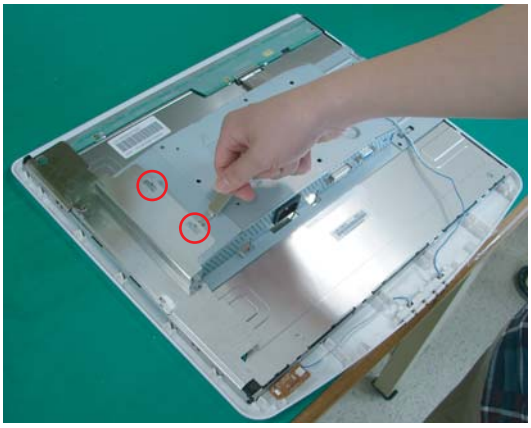
This section of the service manual describes the disassembly and reassembly procedures for the LS17PEA/LS19PEB TFT-LCD monitors.

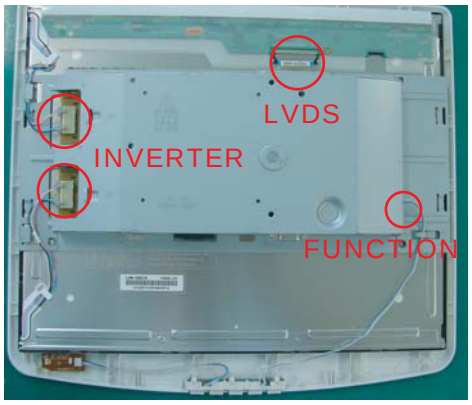
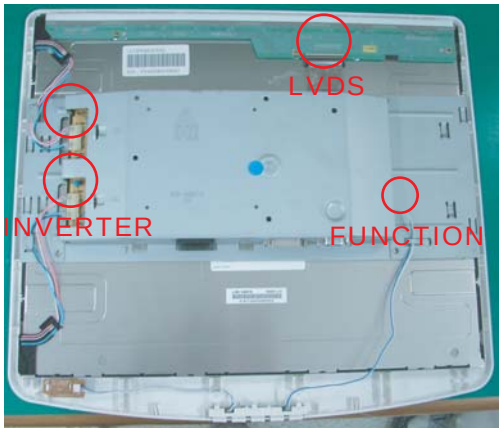
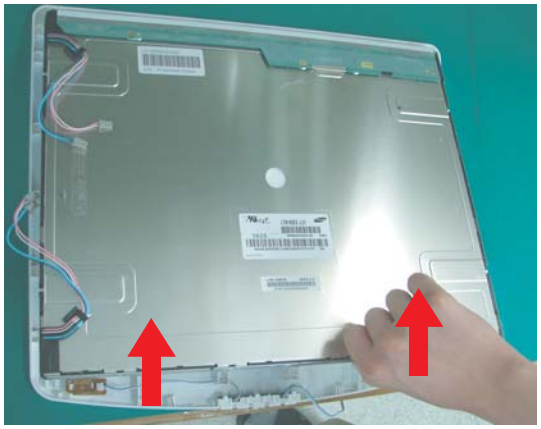
⚠**WARNING: This monitor contains electrostatically sensitive devices. Use caution when handling these components.**

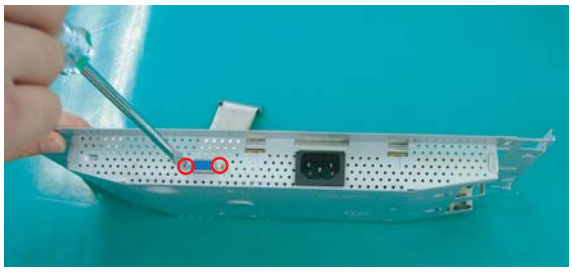
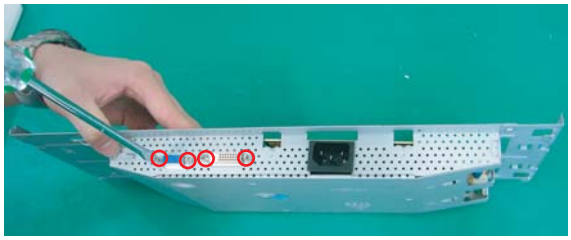
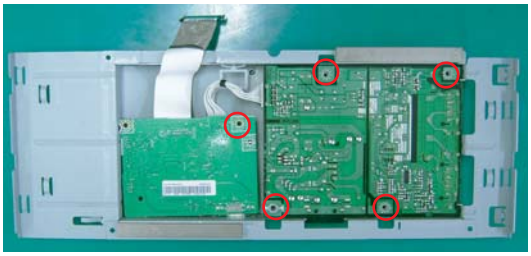
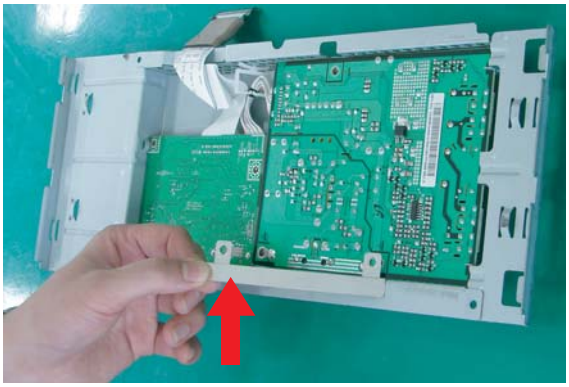
## 11-1 Disassembly

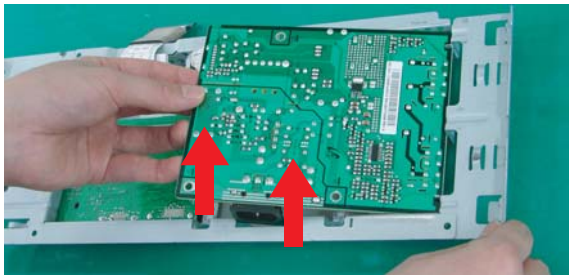
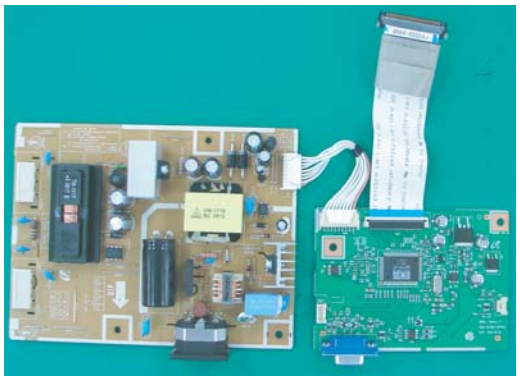
⚠**Cautions: 1. Disassemble stand on a flat desk.**
**2. Disconnect the monitor from the power source before disassembly.**

| Description | Picture Description |
|---|---|
| 1. Place a soft cloth on the desk and place the monitor on the cloth upside down. Remove the stand in the direction of the arrow. |  |
| 2. Turn the monitor so the front section is facing upwards. Remove the marked parts from the front cover, as shown in the figure below. |  |
| 3. Remove the marked part from the top edge of the front cover, as shown in the figure below. |  |

| Description | Picture Description |
|---|---|
| 4. Remove the marked parts from both sides of the front cover, as shown in the figure below. |  |
| 5. Remove the marked part from the front cover, as shown in the figure below.<br><br>Caution: Do not lift the front cover over position (1), which may cause damage to it. |  |
| 6. Turn the monitor so the back of it is facing upwards. Lift up and remove the back cover. | |
| 7. Use the jig to remove the shield lamp. (Be careful Shield.) |  |

| Description | Picture Description |
|---|---|
| 8. Disconnect cables.<br>(LVDS, INVERTER and FUNCTION cable) | 17"<br>  <br><br>19"<br>  <br> |
| 9. Lift up the LCD panel. |  |
| 10. LCD Panel | |

| Description | Picture Description |
|---|---|
| 11.Remove screws.<br>(17"=2 screws, 19"=4 screws) | 17"<br>  <br>19"<br>  |
| 12. Remove 5 screws. |  |
| 13. Lift up the Bracket Support. |  |

| Description | Picture Description |
|---|---|
| 14. Lift up the Main PCB and IB Board. |  |
| 15. Main PCB and IB Board | 17"<br>  |
| | 19"<br> |

## 11-2 Reassembly

Reassembly procedures are in the reverse order of disassembly procedures.

# 11-3 Stand

## 11-3-1 Installing the Stand

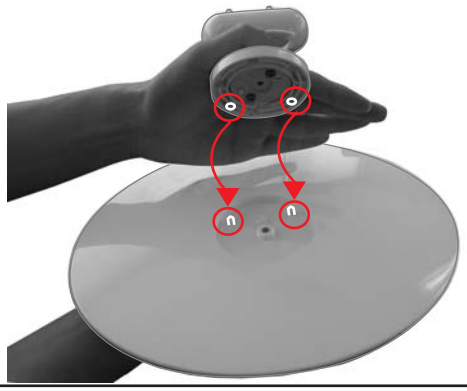
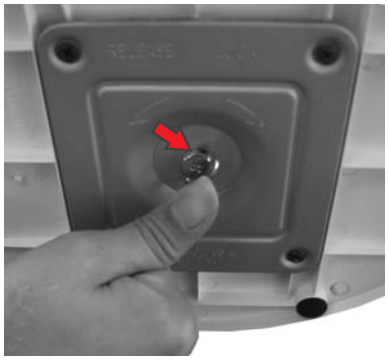
A: Monitor

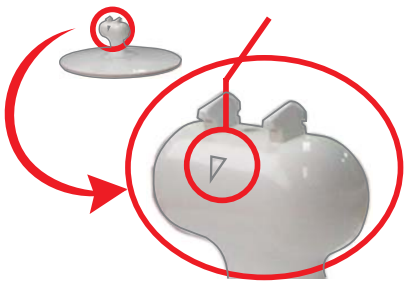
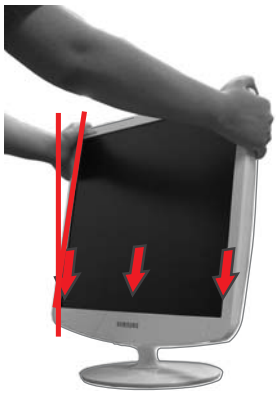
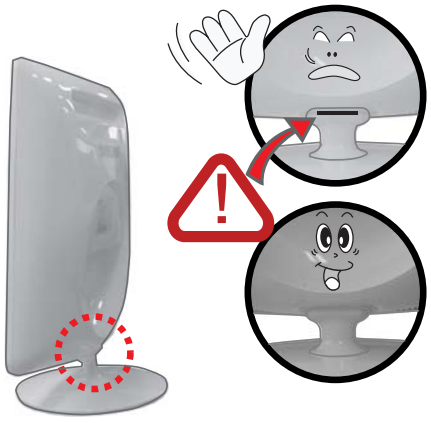
B: Connecting pin

C: Stand

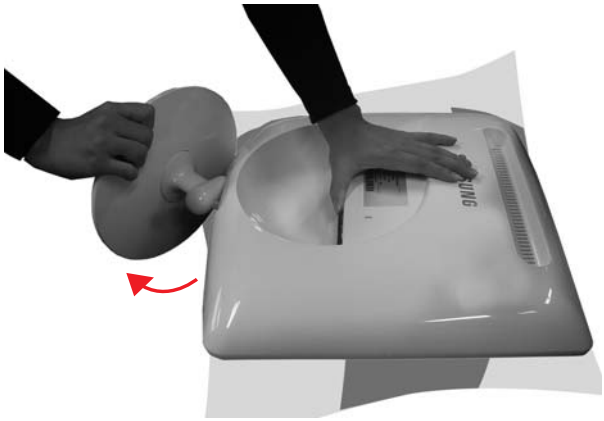
**⚠ Caution**

When lifting up or moving the monitor, do not lift the monitor upside down while holding only the stand, as this may cause the monitor to fall, leading to damage or personal injury.

| Description | Picture Description |
|---|---|
| 1. Insert the connecting pin into the stand. |  |
| 2. Stand the screw handles up and tighten the screws firmly by turning them. | |
| 3. Place the screw handles back down. |  |

| Description | Picture Description |
|---|---|
| 4. Turn the stand so ▽mark on the connecting pin is facing the front. |  |
| 4. Check the connecting part between the monitor and the stand. | |
| 4. Tilt the monitor upwards at an angle of 5 ° to 10° so that the base is closer to you than the top. Then hold the monitor on the stand by its top parts and push them downwards.<br><br>(You can assemble it more easily by pushing it down while wriggling it a little to the left and right.) |  |
| 5. When the monitor is assembled correctly, the straight groove line at the back of the connecting pin will not be visible when the monitor is erected at 90°. |  |

## 11-3-2 Removing the Stand

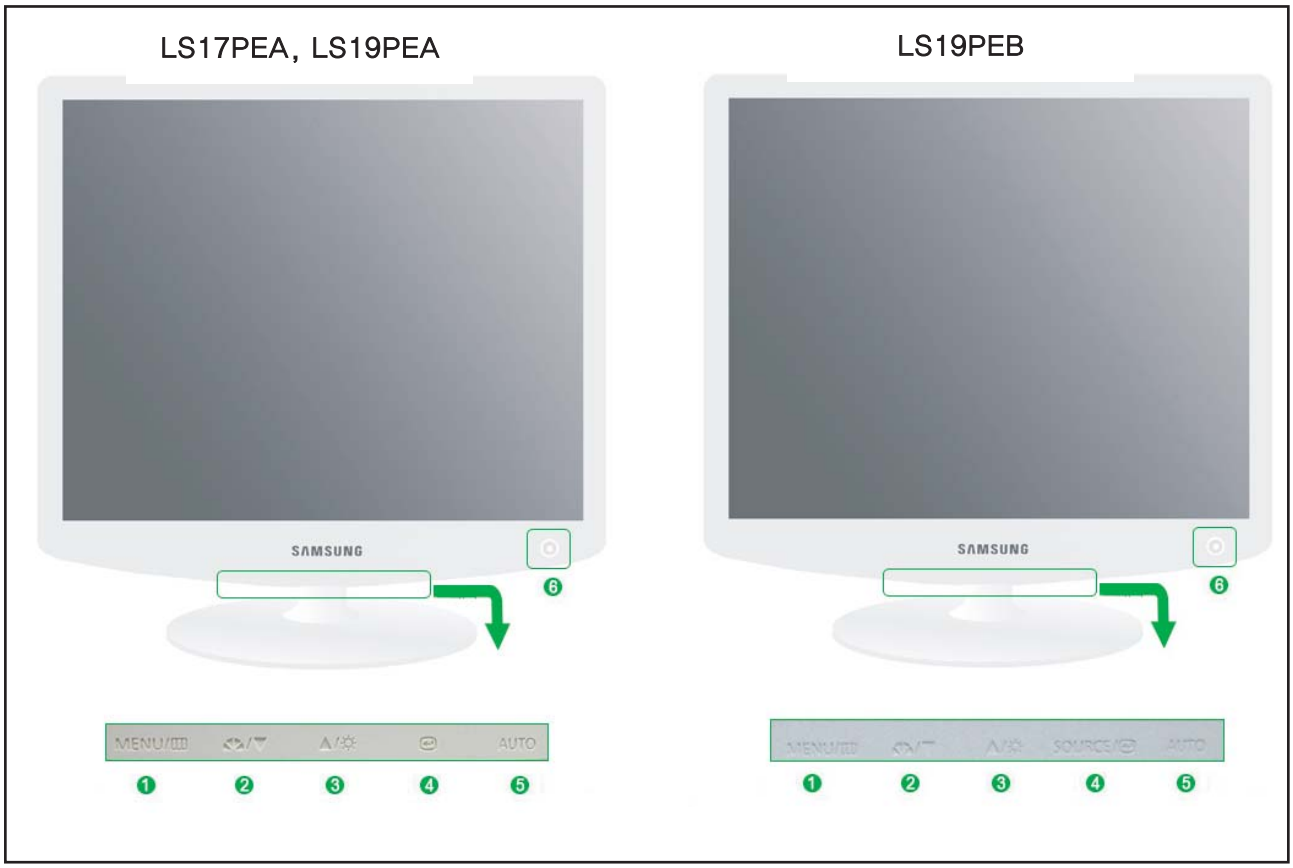
| Description | Picture Description |
|---|---|
| 1. Place a soft cloth or cushion on the table and place the monitor with the front facing downwards. | |
| 2. Hold the monitor and lean the stand upwards. | |
| 3. Hold the monitor, and then twist the stand strongly to the left and pull it out. |  |
| 4. Stand the screw handles up and unfasten the screws by turning them. | |

| Description | Picture Description |
| --- | --- |
| 5. Remove the connecting pin from the stand. | |

## Memo

# 10 Operating Instructions and Installation

## 10-1 Front




**1. Menu button**
Opens the OSD menu. Also use to exit the OSD menu or return to the previous menu.

**2. MagicBright button**
MagicBright is a new feature providing optimum viewing environment depending on the contents of the image you are watching. Currently six different modes are available: Custom, Text, Internet, Game, Sport and Movie. Each mode has its own pre-configured brightness value. You can easily select one of six settings by simply pressing MagicBright control buttons.

1) Custom
Although the values are carefully chosen by our engineers, the pre-configured values may not be comfortable to your eyes depending on your taste. If this is the case, adjust the brightness and contrast by using the OSD menu.

2) Text
For documentations or works involving heavy text.

3) Internet
For working with a mixture of images such as text and graphics.

4) Game
For watching motion pictures such as a game.

5) Sport
For watching motion pictures such as a sport.

6) Movie
For watching motion pictures such as a DVD or Video CD.

7) Dynamic Contrast
Dynamic Contrast is to automatically detect distribution of inputted visual signal and adjust to create optimum contrast.

**3. Brightness button**
When OSD is not on the screen, push the button to adjust brightness.

**2,3. Adjust buttons**
Adjust items in the menu.

**4. Enter button (LS17PEA, LS19PEA)**
Activates a highlighted menu item.

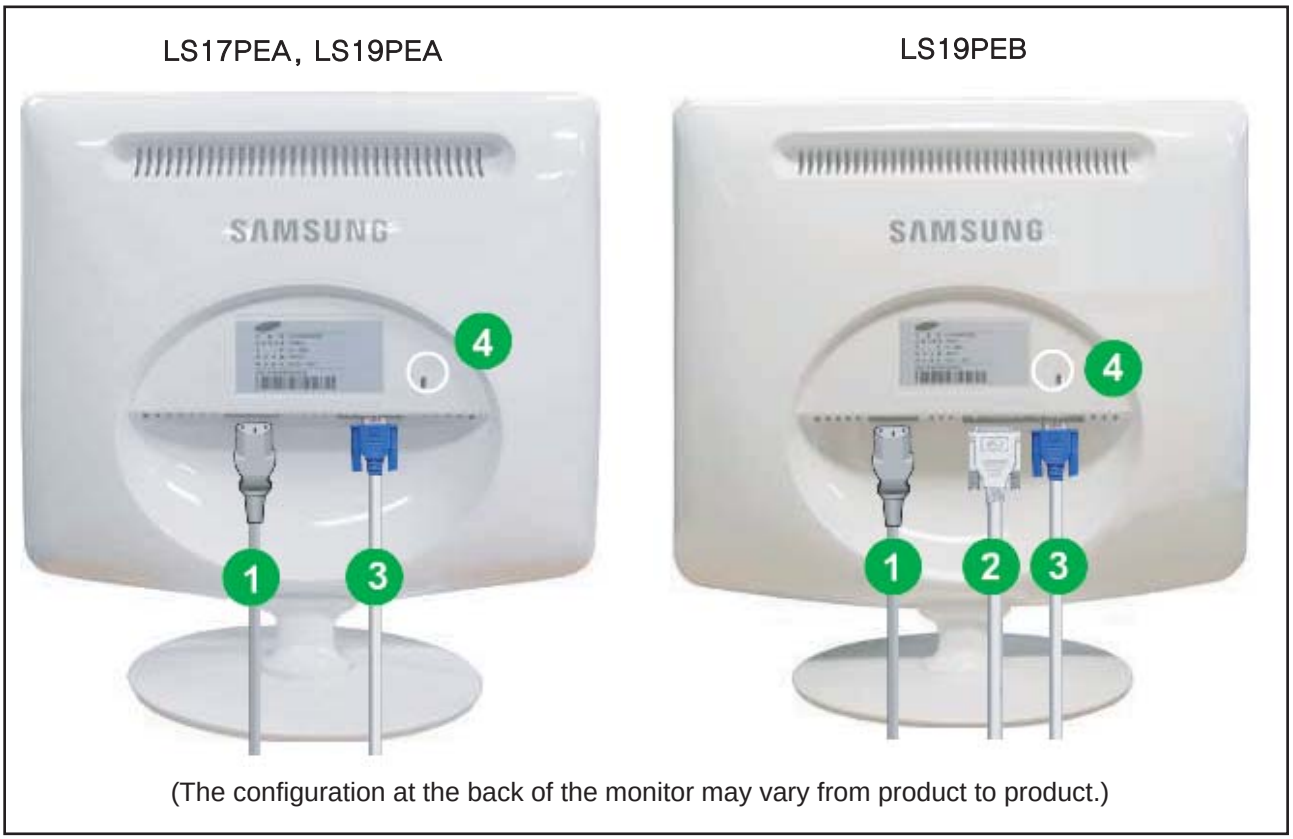
**4. Enter button / SOURCE button (LS19PEB)**
Activates a highlighted menu item. /
Push the 'SOURCE', then selects the video signal while the OSD is off. (When the source button is pressed to change the input mode, a message appears in the upper left of the screen displaying the current mode -- analog or digital input signal.)

**5. AUTO button**
Use this button for auto adjustment.

**6. Power button**
Use this button for turn the monitor on and off.

**Power indicator**
This light glows green during normal operation, and blinks green once as the monitor saves your adjustments.

## 10-2 Rear




(The configuration at the back of the monitor may vary from product to product.)

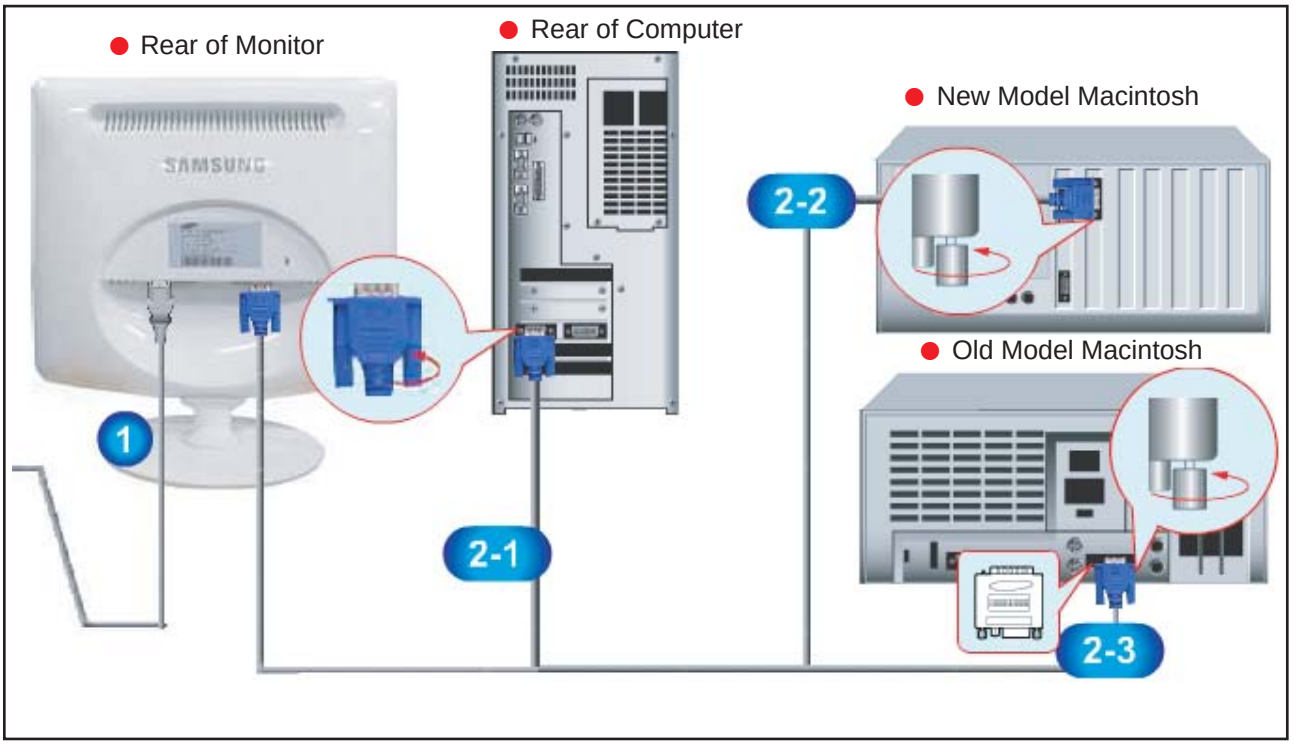
**1. Power port**
Connect the power cord for your monitor to the power port on the back of the monitor.

**2. DVI IN port**
Connect the DVI cable to the DVI port on the back of your monitor.

**3. RGB IN port**
Connect the signal cable to the 15-pin, D-sub port on the back of your monitor.

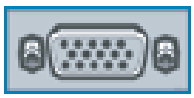
**4. Kensington Lock**
The Kensington lock is a device used to physically fix the system when using it in a public place.

# 10-3 Connecting the monitor (LS17PEA, LS19PEA)




1. Connect the power cord for your monitor to the power port on the back of the monitor.
   Plug the power cord for the monitor into a nearby outlet.

2-1. Using the D-sub (Analog) connector on the video card.
   Connect the signal cable to the 15-pin, D-sub connector on the back of your monitor.

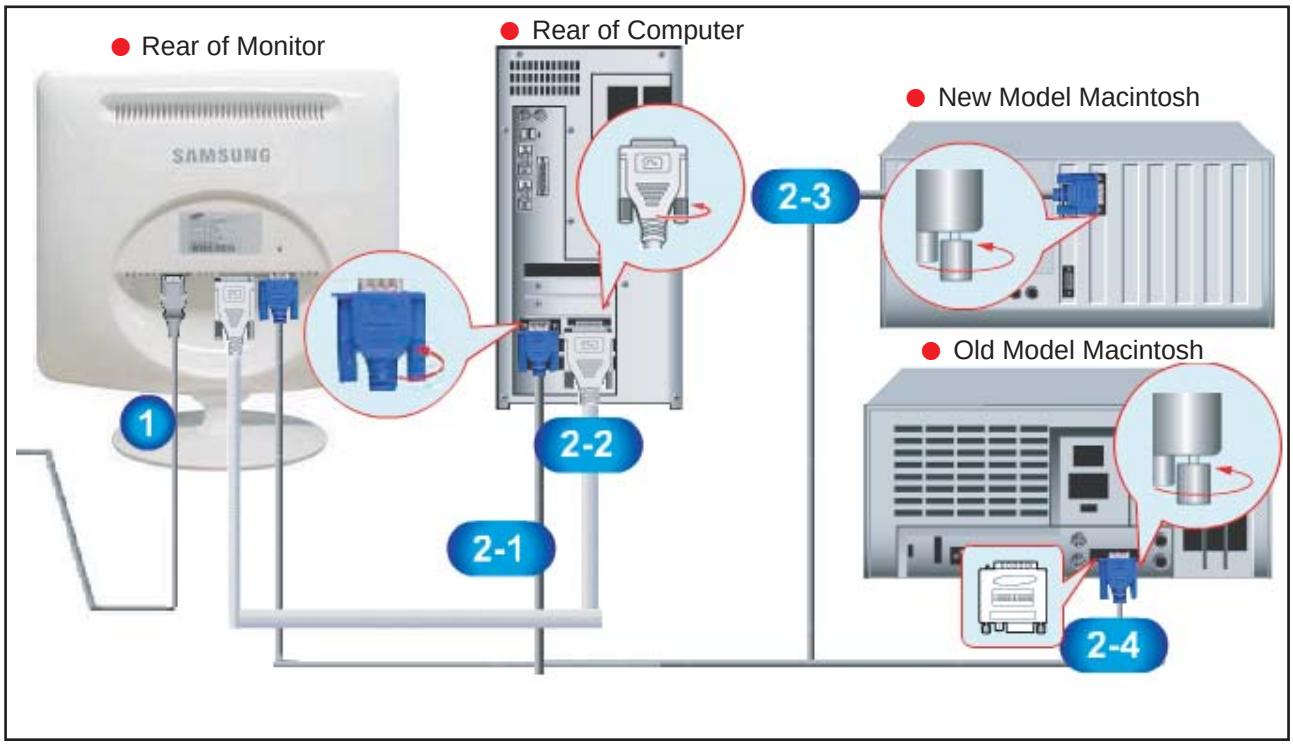


2-2. Connected to a Macintosh.
   Connect the monitor to the Macintosh computer using the D-SUB connection cable.

2-3. In the case of an old model Macintosh, you need to connect the monitor using a special Mac adapter.

3. Turn on your computer and monitor. If your monitor displays an image, installation is complete.

## 10-3-1 Connecting the monitor (LS19PEB)




1. Connect the power cord for your monitor to the power port on the back of the monitor.
   Plug the power cord for the monitor into a nearby outlet.

2-1. Using the D-sub (Analog) connector on the video card.
   Connect the signal cable to the 15-pin, D-sub connector on the back of your monitor.

2-2. Using the DVI (Digital) connector on the video card.
   Connect the DVI cable to the DVI port on the back of your monitor.

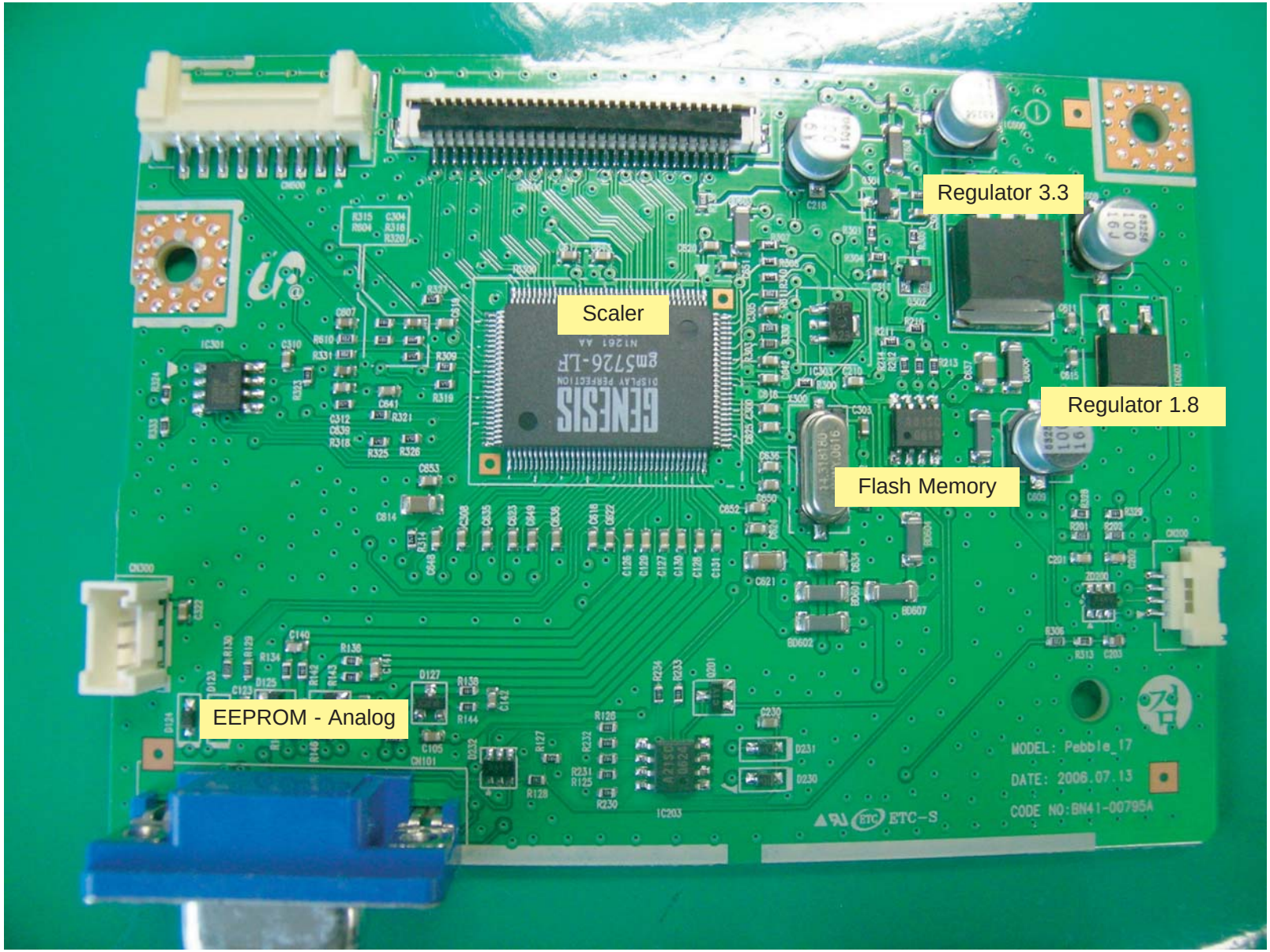
2-3. Connected to a Macintosh.
   Connect the monitor to the Macintosh computer using the D-SUB connection cable.

2-4. In the case of an old model Macintosh, you need to connect the monitor using a special Mac adapter.

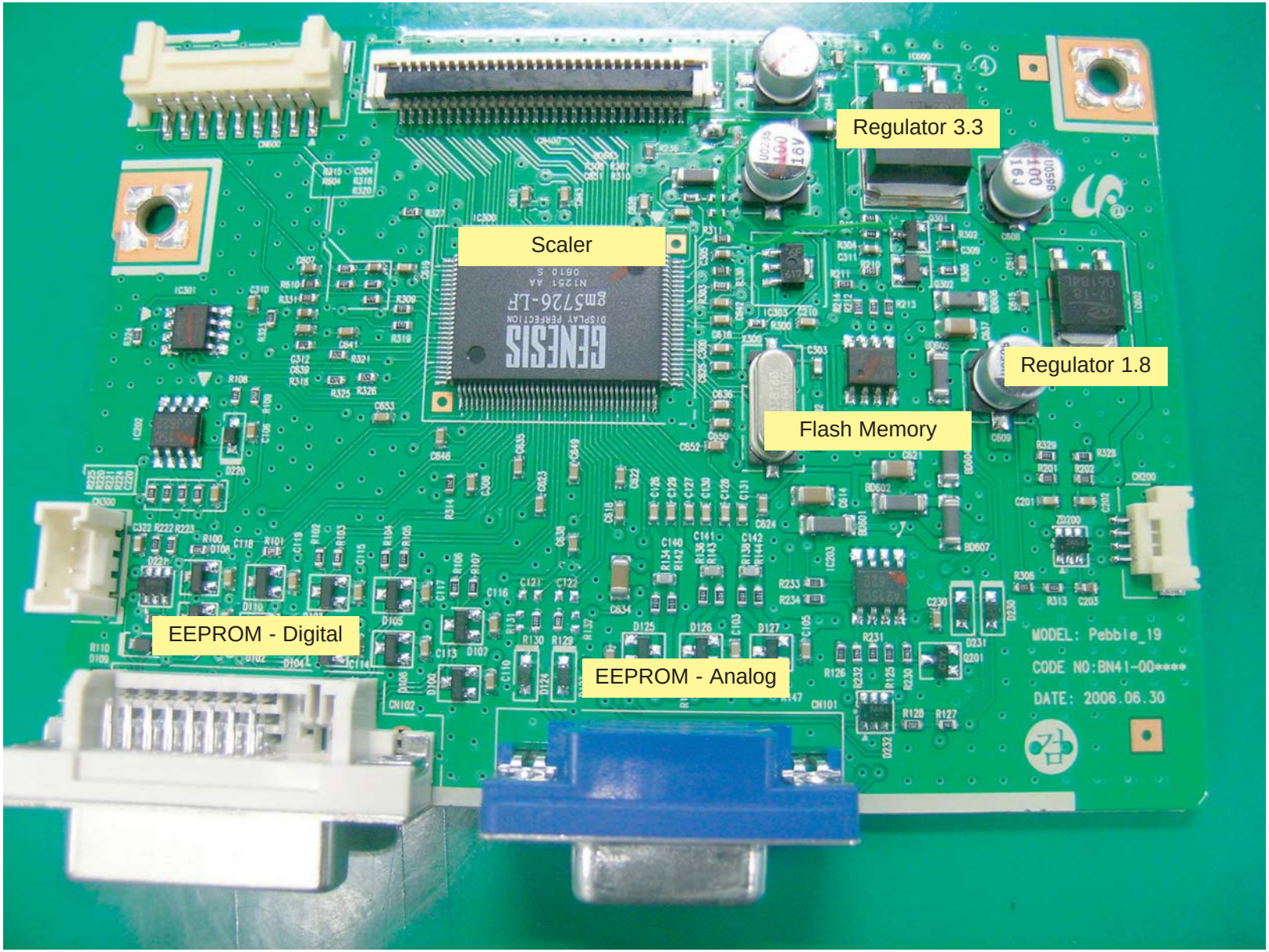
3. Turn on your computer and monitor. If your monitor displays an image, installation is complete.

# 12 PCB Diagram

## 12-1 Main PCB (LS17PEA, LS19PEA)



## 12-2 Main PCB (LS19PEB)



# 14 Reference Infomation

## 14-1 Technical Terms

**-TFT-LCD**
**(Thin film Transistor Liquid Crystal Display)**
ADC(Analog to Digital Converter)
This is a circuit that converts from analog signal to digital signals.

**-PLL(Phase Locked Loop)**
During progressing ADC, Device makes clock synchronizing HSYNC with Video clock

**-Inverter**
Device that supplies Power to LCD panel lamp. This device generates about 1,500~2,000V.

**AC Adapter**
Device that converts AC(90V~240V) to DC(+12V or 14V)

**SMPS(Switching Mode Power Supply)**
Switching Mode Power supply. This design technology is used to step up/down the input power by switching on/off

**-FRC(Frame Rate Controller)**
Technology that changes the number of frames displayed on screen per second.
TFT-LCD panel requires 60 frames per second. This technology is needed to convert input image to 60 frames per second regardless input frame quantity.

**-Image Scaler**
Technology that converts an input resolution to another resolution.(ex. 640* 480 to 1024*768)

**-Auto Configuration(Auto adjustment)**
This is an algorithm to adjust monitor to optimum condition by pushing one key.

**-OSD(On Screen Display)**
Customers can easily control the screen settings using the OSD.

**-FINE**
The "Fine" adjustment is used to adjust visibility by controlling phase difference.

**-COARSE**
This adjustment adjusts the display by tuning Video clock and PLL clock.

**-DVI (Digital Visual Interface)**
This provides a high speed digital connection for visual data types that is display technology independent. This interface is primarily forcused at providing a connection between a computer and its display device.

**-L.V.D.S.(Low Voltage Differential Signaling)**
A kind of transmission method for Digital.It can be used from Main PBA to Panel.

**-T.M.D.S**
**(Transition minimized Differential Signaling)**
a kind of transmission method for Digital.
It can be used from Video card to Main PBA.

**-DDC(Display data channel)**
It is a communication method between Host Computer and related equipment.
It enables Plug and Play between PC and Monitor.

**-EDID**
Extended Display Identification Data PC can recognize monitor information such as Product data, Product name,Display mode,Serial number and Signal source, etc Data is recognised via DDC Line linking PC and Monitor.

**-Dot Pitch**
The image on a monitor is composed of red, green and blue dots. The closer the dots, the higher the resolution. The distance between two dots of the same color is called the 'Dot Pitch'. Unit: mm

**-Vertical Frequency**
The screen must be redrawn several times per second in order to create and display an image for the

user. The frequency of this repetition per second is called Vertical Frequency or Refresh Rate. Unit: Hz
Example: If the same light repeats itself 60 times per second, this is regarded as 60 Hz.

**-Horizontal Frequency**
The time to scan one line connecting the right edge to the left edge of the screen horizontally is called Horizontal Cycle. The inverse number of the Horizontal Cycle is called Horizontal Frequency. Unit: kHz

**-Interlace and Non-Interlace Methods**
Showing the horizontal lines of the screen from the top to the bottom in order is called the Non-Interlace method while showing odd lines and then even lines in turn is called the Interlace method. The Non-Interlace method is used for the majority of monitors to ensure a clear image. The Interlace method is the same as that used in TVs.

-**Plug & Play**
This is a function that provides the best quality screen for the user by allowing the computer and the monitor to exchange information automatically. This monitor follows the international standard VESA DDC for the Plug & Play function.

**-Resolution**
The number of horizontal and vertical dots used to compose the screen image is called 'resolution'. This number shows the accuracy of the display. High resolution is good for performing multiple tasks as more image information can be shown on the screen.

**Example**: If the resolution is 1280 x 1024 , this means the screen is composed of 1280 horizontal dots (horizontal resolution) and 1024 vertical lines (vertical resolution).

## 14-2 Pin Assignments

| Sync Type / Pin No. | 15-Pin D-Sub Signal Cable Connector | | |
|---|---|---|---|
| | Separate | Composite | Sync-on-green |
| 1 | Red | Red | Red |
| 2 | Green | Green | Green + H/V Sync. |
| 3 | Blue | Blue | Blue |
| 4 | GND | GND | GND |
| 5 | DDC Return (GND) | DDC Return (GND) | DDC Return (GND) |
| 6 | GND-R | GND-R | GND-R |
| 7 | GND-G | GND-G | GND-G |
| 8 | GND-B | GND-B | GND-B |
| 9 | DDC Power Input (+5V) | DDC Power Input (+5V) | DDC Power Input (+5V) |
| 10 | Self Raster | Self Raster | Self Raster |
| 11 | GND | GND | GND |
| 12 | Bi-Dr Data (SDA) | Bi-Dr Data (SDA) | Bi-Dr Data (SDA) |
| 13 | H-Sync. | H/V-Sync. | Not Used |
| 14 | V-Sync. | Not Used | Not Used |
| 15 | DDC Clock (SCL) | DDC Clock (SCL) | DDC Clock (SCL) |

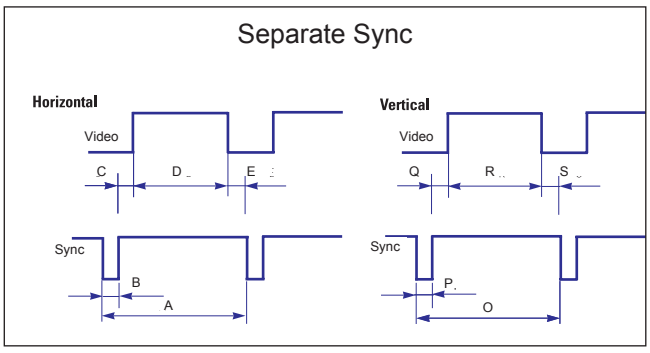
| Sync Type / Pin No. | 24P DVI-D | | |
|---|---|---|---|
| 1 | Rx2- | 13 | No Connection |
| 2 | Rx2+ | 14 | +5V_M |
| 3 | GND | 15 | Self Raster |
| 4 | No Connection | 16 | +5V_M |
| 5 | No Connection | 17 | Rx0- |
| 6 | DDC Clock (SCL) | 18 | Rx0+ |
| 7 | DDC Data (SDA) | 19 | NC |
| 8 | NC | 20 | No Connection |
| 9 | Rx1- | 21 | No Connection |
| 10 | Rx1+ | 22 | NC |
| 11 | NC | 23 | RxC+ |
| 12 | No Connection | 24 | RxC- |

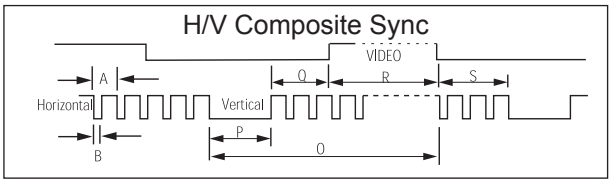
# 14-3 Timing Chart

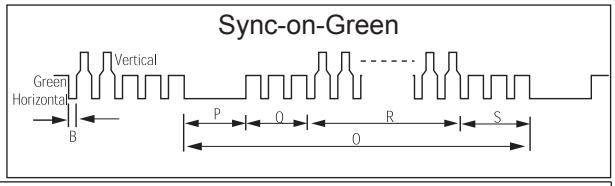
This section of the service manual describes the timing that the computer industry recognizes as standard for computer-generated video signals.

Table 14-1 Timing Chart

| Mode / Timing | IBM | | VESA | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | VGA2/ 70 Hz 720 x 400 | VGA3/ 60 Hz 640 x 480 | 640/75 Hz 640x480 | 800/60 Hz 800x600 | 800/75 Hz 800x600 | 1024/60 Hz 1024x768 | 1024/75 Hz 1024x768 | 1280/60 Hz 1280x1024 | 1280/75 Hz 1280x1024 |
| fH (kHz) | 31.469 | 31.469 | 37.500 | 37.879 | 46.875 | 48.363 | 60.023 | 63.981 | 79.975 |
| A µsec | 31.777 | 31.778 | 26.667 | 26.400 | 21.333 | 20.677 | 16.660 | 11.852 | 12.504 |
| B µsec | 3.813 | 3.813 | 2.032 | 3.200 | 1.616 | 2.092 | 1.219 | 1.037 | 1.067 |
| C µsec | 1.589 | 1.589 | 3.810 | 2.200 | 3.232 | 2.462 | 2.235 | 2.296 | 1.837 |
| D µsec | 26.058 | 26.058 | 20.317 | 20.000 | 16.162 | 15.754 | 13.003 | 9.259 | 9.481 |
| E µsec | 0.318 | 0.318 | 0.508 | 0.000 | 0.323 | 0.369 | 0.203 | 0.000 | 0.119 |
| fV (Hz) | 70.087 | 59.940 | 75.000 | 60.317 | 75.000 | 60.004 | 75.029 | 60.020 | 75.025 |
| O msec | 14.268 | 16.683 | 13.333 | 16.579 | 13.333 | 16.666 | 13.328 | 16.005 | 13.329 |
| P msec | 0.064 | 0.064 | 0.080 | 0.106 | 0.064 | 0.124 | 0.050 | 0.047 | 0.038 |
| Q msec | 0.858 | 0.794 | 0.427 | 0.607 | 0.448 | 0.600 | 0.466 | 0.594 | 0.475 |
| R msec | 13.155 | 15.761 | 12.800 | 15.840 | 12.800 | 15.880 | 12.795 | 15.630 | 12.804 |
| S msec | 0.191 | 0.064 | 0.027 | 0.0261 | 0.021 | 0.062 | 0.017 | 0.016 | 0.013 |
| Clock Freq. (MHz) | 28.322 | 26.175 | 31.500 | 40.000 | 49.500 | 75.000 | 78.750 | 108.000 | 135.000 |
| Polarity H.Sync | Negative | Negative | Negative | Positive | Positive | Negative | Positive | Positive | Positive |
| V.Sync | Positive | Negative | Negative | Positive | Positive | Negative | Positive | Positive | Positive |
| Remark | Separate | Separate | Separate | Separate | Separate | Separate | Separate | Separate | Separate |




A : Line time total B : Horizontal sync width
P : Vertical sync width

C : Back porch D : Active time
R : Active time

O : Frame time total

Q : Back porch

## 14-4 Preset Timing Modes

-If the signal transferred from the computer is the same as the following Preset Timing Modes, the screen will be adjusted automatically. However, if the signal differs, the screen may go blank while the power LED is on. Refer to the video card manual and adjust the screen as follows.

Table 1. Preset Timing

| Display Mode | Horizontal Frequency (kHz) | Vertical Frequency (Hz) | Pixel Clock (MHz) | Sync Polarity (H/V) |
|---|---|---|---|---|
| MAC, 640 x 480 | 35.000 | 66.667 | 30.240 | -/- |
| MAC, 832 x 624 | 49.726 | 74.551 | 57.284 | -/- |
| MAC,1152 x870 | 68.681 | 75.062 | 100.000 | -/- |
| IBM, 640 x 350 | 31.469 | 70.086 | 25.175 | +/- |
| IBM, 640 x 480 | 31.469 | 59.940 | 25.175 | -/- |
| IBM, 720 x 400 | 31.469 | 70.087 | 28.322 | -/+ |
| VESA, 640 x 480 | 37.500 | 75.000 | 31.500 | -/- |
| VESA, 640 x 480 | 37.861 | 72.809 | 31.500 | -/- |
| VESA, 800 x 600 | 35.156 | 56.250 | 36.000 | +,-/+,- |
| VESA, 800 x 600 | 37.879 | 60.317 | 40.000 | +/+ |
| VESA, 800 x 600 | 46.875 | 75.000 | 49.500 | +/+ |
| VESA, 800 x 600 | 48.077 | 72.188 | 50.000 | +/+ |
| VESA, 1024 x 768 | 48.363 | 60.004 | 65.000 | -/- |
| VESA, 1024 x 768 | 56.476 | 70.069 | 75.000 | -/- |
| VESA, 1024 x 768 | 60.023 | 75.029 | 78.750 | +/+ |
| VESA, 1152 x 864 | 67.500 | 75.000 | 108.00 | +/+ |
| VESA 1280 x 960 | 60.000 | 60.000 | 108.00 | +/+ |
| VESA, 1280 x 1024 | 63.981 | 60.020 | 108.00 | +/+ |
| VESA, 1280 x 1024 | 79.976 | 75.025 | 135.00 | +/+ |

**Horizontal Frequency**
The time to scan one line connecting the right edge to the left edge of the screen horizontally is called Horizontal Cycle and the inverse number of the Horizontal Cycle is called Horizontal Frequency. Unit: kHz

**Vertical Frequency**
Like a fluorescent lamp, the screen has to repeat the same image many times per second to display an image to the user. The frequency of this repetition is called Vertical Frequency or Refresh Rate. Unit: Hz

# 14-5 Panel Description

| Maker | VENDOR P/N | PANEL_CODE | PANEL_ABB | STICKER_CODE | Remarks |
|---|---|---|---|---|---|
| SEC | LT140X1-002 | BN07-00004A | SA | BN68-00239H | - |
| SEC | LT150XS-L01 | BN07-00009A | SB | | - |
| SEC | LT150XS-L01-B | BN07-00022A | SC | | - |
| SEC | LTM150XS-L02 | BN07-00005A | SD | | - |
| SEC | LT181E2-132 | BN07-00001A | SE | | - |
| SEC | LT150XS-T01 | BN07-00010A | SF | | - |
| SEC | LTM181E3-132 | BN07-00019A | SG | | - |
| SEC | LT170E2-131 | BN07-10001D | SH | | - |
| SEC | LT181E2-131 | BN07-10001E | SJ | | - |
| SEC | LTM170E4-L01 | BN07-00018A | SK | | - |
| SEC | LTM240W1-L01 | BN07-00015A | SL | | - |
| SEC | LTM213U3-L01 | BN07-00016A | SM | | - |
| SEC | LTM150XH-L01 | BN07-00026A | SN | | - |
| SEC | LTM150XH-L03 | BN07-00027A | SP | | - |
| SEC | LTM150XS-L01 | BN07-00032A | SQ | | DELL(ZPD) |
| SEC | LTM181E4-L01 | BN07-00034A | SR | | PVA |
| SEC | LTM170EH-L01 | BN07-00036A | SS | | TN |
| SEC | LTM170E5-L01 | BN07-00037A | SU | | PVA |
| SEC | LTM150XH-L11 | BN07-00041A | SV | | - |
| SEC | LTM213U4-L01 | BN07-00039A | SW | | PVA |
| SEC | LTM150XH-L01(ZPD) | BN07-00045A | SX | | ZPD |
| SEC | LTM150XH-L04 | BN07-00046A | SY | | "New panel with high brightness" |
| SEC | LTM170W1-L01 | BN07-00047A | SZ | | Panel for TV |
| SEC | LTM150XH-L06 | BN07-00053A | EA | | Panel for TV/ High luminance for 450cd _ SONY&EOS Team Panel for TV |
| SEC | LTM153W1-L01 | BN07-00054A | EB | | Use NIKE MODEL |
| SEC | LTM170EH-L05 | BN07-00055A | EC | | Panel EOS proj. for high brightness of 17" EH-L05 |
| SEC | LTM170E5-L03 | BN07-00056A | ED | | Dell 1702FP pro. E4. EH mechanicalCompatible |
| SEC | LTM190E1-L01 | BN07-00057A | EE | | DELL 1900 FP |
| SEC | LTM181E5-L01 | BN07-00061A | EF | | 18" narrow bezel GH18PS |
| SEC | LTM150XP-L01 | BN07-00065A | EG | | AMLCD PVA PANEL |
| SEC | LTM240W1-L02 | BN07-00062A | EH | | Panel for 15" Wide TV |
| SEC | LTM170EU-L01 | BN07-00071A | EJ | | Slim design, TN |
| SEC | LTM170E5-L04 | BN07-00072A | EK | | E5-L04 6 bits FRC... for IBM |
| SEC | LTA220W1-L01 | BN07-00074A | EL | | Panel for 22" TV |
| SEC | LTM170E6-L02 | BN07-00075A | EM | | AMLCD Narrow & slim design 17" PVAmode |
| SEC | LTM170W1-L01 | BN07-00082A | EN | | LTM170W1-L01 ZPD panel |
| SEC | LTM170EH-L01 | BN07-00080A | EP | | LTM170EH-L01 ZPD panel |
| SEC | LTM170E5-L01 | BN07-00081A | EQ | | LTM170E5-L01 ZPD panel |
| SEC | LTM170EH-L05 | BN07-00083A | ER | | LTM170EH-L05 ZPD panel |
| SEC | LTM170E5-L03 | BN07-00084A | ES | | LTM170E5-L03 ZPD panel |
| SEC | LTM170EU-L01 | BN07-00085A | ET | | LTM170EU-L01 ZPD panel |
| SEC | LTM170E5-L04 | BN07-00086A | EU | | LTM170E5-L04 ZPD panel |
| SEC | LTM170E6-L02 | BN07-00087A | EV | | LTM170E6-L02 ZPD panel |
| SEC | LTM150XH-L06 | BN07-00091A | EW | | "Color coordinates change for LCD TV" |
| SEC | LTM153W1-L01 | BN07-00092A | EX | | AMLCD WIDE 15",9/10 |
| SEC | LTM170W1-L01 | BN07-00100A | EY | | "Color Coordinates change code management" |
| SEC | LTM170EH-L05 | BN07-00097A | EZ | | "LTM170E5-L05 Color Coordinates Change Panel Code" |
| SEC | LTA400W1-L01 | BN07-00109A | S1 | | "PANEL of AMLCD 40"" TV" |
| SEC | LTM153W1-L01 | BN07-00110A | S2 | | "Color coordinates change 0.280/0.290, 10000k & ZPD Panel" |
| SEC | LTM150XH-L06 | BN07-00111A | S3 | | "Color coordinates change 0.280/0.290, 10000k & ZPD Panel" |
| SEC | LTM170W1-L01 | BN07-00112A | S4 | | "Color coordinates change 0.280/0.290, 10000k & ZPD Panel" |
| SEC | LTM170EH-L05 | BN07-00113A | S5 | | "Color coordinates change 0.280/0.290, 10000k & ZPD Panel" |
| SEC | LTM220W1-L01 | BN07-00114A | S6 | | "ZPD Panel for AMLCD 22"" TV" |

| Maker | VENDOR P/N | PANEL_CODE | PANEL_ABB | STICKER_CODE | Remarks |
|---|---|---|---|---|---|
| SEC | LTM150XH-L06 | BN07-00117A | S7 | | "ZPD Panel code" |
| SEC | LTM153W1-L01 | BN07-00118A | S8 | | "ZPD Panel code" |
| SEC | LTM170WP-L01 | BN07-00119A | S9 | | "PVA Panel for NIKE" |
| SEC | LTM213U4-L01 | BN07-00039A | E1 | | 21.3" NARROW |
| SEC | LTA260W1-L01 | BN07-00121A | E2 | | VENUS |
| SEC | LTA220W1-L01 | BN07-00074B | E3 | | "Panel B-level panel code for 22"" TV Panel " |
| SEC | LTA320W1-L01 | BN07-00108A | E4 | | "Panel for AMLCD 32"" TV" |
| SEC | LTM213U4-L01 | BN07-00124A | E5 | | NARROW BEZEL 21 " PANEL |
| SEC | LTM170E6-L04 | BN07-00129A | E6 | | "HIGHLAND 17"" LOW PANEL (Panel only for TCO03)" |
| SEC | LTM190E1-L01 | BN07-00088A | E7 | | LTM190E1-L01 ZPD panel |
| SEC | M150X4-L06 | BN07-00137A | E8 | | 15" Narrow & Slim panel |
| SEC | LTA170V1 | BN07-00139A | E9 | | "17"" Panel for Muse 4:3 VGA TV" |
| SEC | LTM190E1-L02 | BN07-00128A | E10 | | "New Panel from AMLCDl, Specification : 6bit Driver IC" |
| SEC | LTM170EX-L01 | BN07-00143A | E11 | | "Development new Panel from AMLCD" |
| SEC | LTM170E8-L01 | BN07-00144A | E12 | | "Development new Panel from AMLCD" |
| SEC | LTM170E6-L04 | BN07-00129B | E13 | | "ZPD panel for AMLCD (Panel only for TCO03)" |
| SEC | LTA320W1-L02 | BN07-00108B | E14 | | "Creat B-level Panel code for AMLCD 32"" TV" |
| SEC | LTM190E1-L03 | BN07-00151A | E15 | | "Development new 19"" Panel form AMLCD (Panel only for TCO03)" |
| SEC | LTM240W1-L03 | BN07-00134A | E16 | | "AMLCD 24"" panel development" |
| SEC | LTM190E1-L02 | BN07-00128B | E17 | | "New Panel from AMLCD, Specification : 6bit Driver IC(ZPD)" |
| SEC | LTM190E4-L01 | BN07-00145A | E18 | | "AMLCD 24"" new panel development" |
| SEC | LTM170E8-L01 | BN07-00158A | E19 | | "ZPD code derivation" |
| SEC | LTM170EX-L01 | BN07-00159A | E20 | | "ZPD code derivation" |
| SEC | LTM190E1-L03 | BN07-00151B | E21 | | "Creat new panel code for AMLCD 19"" (Panel only for TCO03)" |
| SEC | LTA460H1-L01 | BN07-00157A | E22 | | "creat panel code for AMLCD 46"" TV " |
| SEC | LTM170EU-L11 | BN07-00160A | E23 | | "creat new panel code for AMLCD 17"" (Panel only for TCO03)" |
| SEC | LTM240W1-L03 | BN07-00134B | E24 | | "24"" panel ZPD code derivation" |
| SEC | LTM190E4-L01 | BN07-00145B | E25 | | "AMLCD 19"" ZPD Panel code derivation" |
| SEC | LTM240W1-L03 | BN07-00134B | E26 | | 24" panel ZPD code derivation |
| SEC | LTM150XO-L01 | BN07-00164A | E27 | | AMLCD 15" XO-L01 new panel development |
| SEC | LTM150XO-L01 | BN07-00164B | E28 | | AMLCD 15" XO-L01 ZPD code derivation |
| SEC | LTM170EU-L11 | BN07-00160B | E29 | | AMLCD 17" NEW panel code derivation |
| SEC | LTA320W2-L01 | BN07-00172A | SPZ | | AMLCD 32" NEW panel |
| SEC | LTM213U4-L01 | BN07-00124B | SPZ | | 21.3" Narrow PANEL ZPD Panel derivation |
| SEC | LTM170EU-L11 | BN07-00189A | STH | | AMLCD EU-L11 Pb free panel code derivtion |
| SEC | LTM170EU-L11 | BN07-00189B | STZ | | AMLCD EU-L11 Pb free panel ZPD code derivation |
| SEC | LTM240W1-L04 | BN07-00188A | SPH | | 24" A-DCC new panel development |
| SEC | LTM190EX-L01 | BN07-00191A | STH | | AMLCD 19" TN new Panel |
| SEC | LTM190EX-L02 | BN07-00191B | STZ | | AMLCD 19" TN new Panel ZPD derivation |
| SEC | LTA230W1-L02 | BN07-00184A | SPZ | | AMLCD 23" 16:9 new Panel |
| SEC | LTA260W2-L01 | BN07-00185A | SPZ | | AMLCD 26" 16:9 new Panel |
| SEC | LTM240M1-L01 | BN07-00195A | SPH | | 24" panel with high brightness deveiopment |
| SEC | LTA400W2-L01 | BN07-00186A | SPZ | | AMLCD 40" 16:9 new Panel |
| SEC | LTM150XO-L01 | BN07-00197A | STH | | AMLCD 15" XO-L01 Pb free panel code |
| SEC | LTM150XO-L01 | BN07-00197B | STZ | | AMLCD 15" XO-L01 Pb free panel ZPD code |
| SEC | LTM170EU-L21 | BN07-00202A | STZ | | AMLCD EU-L21 ZPD new code derivation |
| SEC | LTA460W2-L03 | BN07-00187A | SPZ | | BEETOVEN 46"ZPD new Panel |
| | | | | | |
| CPT | CLAA150XG09 | BN07-00141A | PA | | CPT 15" Monitor new panel development |
| CPT | CLAA170EA02 | BN07-00148A | PB | | 17" CPT NEW development panel |
| CPT | CLAA170EA02 | BN07-00148B | PC | | 17" CPT ZPD panel code derivation |
| CPT | CLAA150XG09 | BN07-00141B | PTZ | | "CPT 15"" panel ZPD code derivation (GOYA-PJT)" |
| CPT | CLAA150XP01 | BN07-00173A | PTH | | CPT 15" PSWG code derivation |
| CPT | CLAA150XP01 | BN07-00173B | PTZ | | CPT 15" PSWG panel ZPD code |

| Maker | VENDOR P/N | PANEL_CODE | PANEL_ABB | STICKER_CODE | Remarks |
|---|---|---|---|---|---|
| CPT | CLAA170EA07 | BN07-00174A | PTH | | "CPT 17"" PSWG panel code derivation? |
| CPT | CLAA170EA07 | BN07-00174B | PTZ | | CPT 17""""" PSWG type new Panel code""" |
| CPT | CLAA170EA07 | BN07-00174B | PTZ | | CPT 17" PSWG type new Panel code |
| | | | | | |
| TOSHIBA | LTM15C419(A) | BN07-00002A | TA | | - |
| TOSHIBA | LTM15C423(B) | BN07-00006A | TB | | - |
| TOSHIBA | LTM18C161 | BN07-00008A | TC | | - |
| TOSHIBA | LTM15C443 | BN07-00031A | TD | | - |
| TOSHIBA | LTM15C458 | BN07-00043A | TE | | - |
| TOSHIBA | LTM15C458S | BN07-00077A | TF | | "TSB 15"" high brightness Panel" |
| TOSHIBA | LTM15C458 | BN07-00078A | TG | | Toshiba ZPD panel |
| TOSHIBA | LTM15C458S | BN07-00099A | TH | | TSB LTM15C458S ( ZPD ) |
| | | | | | |
| HANNSTAR | HSD150MX41A(A) | BN07-00020A | NA | | "TTL type" |
| HANNSTAR | HSD150MX12 | BN07-00030A | NB | | "TTL type" |
| HANNSTAR | HSD170ME13 | BN07-00180A | NTH | | Hannstar 17" TN new panel development |
| HANNSTAR | HSD170ME13 | BN07-00180B | NTZ | | Hannstar 17" TN new panel development ZPD code derivation |
| | | | | | |
| TORISAN | TM150XG-22L03(A) | BN07-00021A | RA | | - |
| TORISAN | TM150XG-26L06 | BN07-00042A | RB | | - |
| TORISAN | TM181SX-76N01 | BN07-00048A | RC | | - |
| TORISAN | TM150XG-26L06 | BN07-00059A | RD | | 15" XGA TN MODE(ZPD) |
| TORISAN | TM290WX-71N31 | BN07-00063A | RE | | "RS24NS (TORISAN 29"" NEW PANEL)" |
| TORISAN | TM396WX-71N31 | BN07-00064A | RF | | "RS24NS (TORISAN 40"" NEW PANEL)" |
| TORISAN | TM150XG-26L09 | BN07-00073A | RG | | "Panel for 15"" TV" |
| TORISAN | TM150XG-26L10 | BN07-00089A | RH | | "L10(change except D/IC) ZPD" |
| TORISAN | TM150XG-26L10 | BN07-00090A | RJ | | L10 NORMAL |
| TORISAN | TM190SX-70N01 | BN07-00098A | RK | | Torisan 19" Panel |
| TORISAN | TM181SX-76N01 | BN07-00106A | RL | | ZPD Panel code |
| TORISAN | TM190SX-70N01 | BN07-00107A | RM | | ZPD Panel code |
| TORISAN | TM290WX-71N31 | BN07-00115A | RN | | "Color Coordinates change panel for TORISAN 29"" TV" |
| TORISAN | TM396WX-71N31 | BN07-00116A | RP,Q | | "Color Coordinates change panel for TORISAN 40"" TV" |
| TORISAN | TM22OWX-71N31 | BN07-00125A | RR | | "Development TORISAN 22"" TV PANEL (ZPD)" |
| TORISAN | TM22OWX-71N31 | BN07-00127A | RS | | "Development TORISAN 22"" TV PANEL (HPD)" |
| TORISAN | TM396WX-71N32A | BN07-00150A | RT | | 120V inverter Exclusive panel |
| TORISAN | TM190SX-70N02 | BN07-00154A | RMH | | Torisan 6bit panel code Derivation |
| TORISAN | TM190SX-70N02 | BN07-00154B | RMZ | | Torisan 6bit panel code Derivation |
| | | | | | |
| SHARP | LQ181E1DG11(A) | BN07-10001C | PA | | - |
| SHARP | LQ150X1LW71 | BN07-00067A | PB | | SHARP 15" PVA PANEL |
| | | | | | |
| HITACHI | TX38D12VC0CAA(A) | BN07-00003A | HA | | - |
| HITACHI | TX43DVCOCAB | BN07-00060A | HB | | 17" SXGA PVA MODE |
| HITACHI | TX43D15VC0CAB | BN07-00101A | HC | | ZPD Panel |
| HITACHI | TX51D11VC0CAB | BN07-00122A | HD | | 20.1" NARROW |
| HITACHI | TX54D11VC0CAB | BN07-00123A | HE | | 21.3" NARROW |
| HITACHI | TX80D12VC0CAB | BN07-00169A | HIZ | | "Development new panel for Hitachi 32"" TV (ZPD)" |
| HITACHI | TX54D11VC0CAB | BN07-00123B | HIZ | | Hitachi 21.3"ZPD panel |
| | | | | | |
| IBM | ITSX94S | BN07-00017A | IA | | - |
| | | | | | |
| UNIPAC | UM170E0 | BN07-00028A | UA | | Loaded by cisdba |
| | | | | | |
| HYUNDAI | HT15X13 | BN07-00035A | DA | | - |

| Maker | VENDOR P/N | PANEL_CODE | PANEL_ABB | STICKER_CODE | Remarks |
|---|---|---|---|---|---|
| HYUNDAI | HT17E11-200 | BN07-00049A | DB | | TN MODE |
| HYUNDAI | HT17E11-300 | BN07-00093A | DC | | HT17E11-300 ZPD panel |
| HYUNDAI | HT17E11-400 | BN07-00094A | DD | | HT17E11-400 normal panel |
| HYUNDAI | HT17E11-400 | BN07-00095A | DE | | HT17E11-400 ZPD panel code |
| HYUNDAI | HT17E12 | BN07-00096A | DF | | HT17E12 ( Narow & slim Design ) |
| HYUNDAI | HT17E12 | BN07-00105A | DG | | ZPD Panel code |
| HYUNDAI | HT15X15-D00 | BN07-00146A | DH | | "Development for Ares 15"" Hydis TV" |
| HYUNDAI | HT15X15-D01 | BN07-00146B | DJ | | "Derivation panel HPD for Ares 15"" Hydis TV " |
| HYUNDAI | HT17E13-100 | BN07-00167A | DTH | | "PINEHURST-2(IBM) PJT 17"" HYDIS PANEL Derivation" |
| HYUNDAI | HT17E13-100 | BN07-00167B | DTZ | | "PINEHURST-2(IBM) Hydis 17"" ZPD code Derivation" |
| | | | | | |
| ACER | L170E3 | BN07-00044A | AA | | TN(ADT) |
| ACER | M170EN05 | BN07-00076A | AB | | AU 17" Panel (Narrow & slim design) |
| ACER | M170EN05 | BN07-00102A | AC | | ZPD Panel code |
| ACER | M190EN02 | BN07-00170A | AMH | | "AU Monitor 19"" new panel development (P19-1S)" |
| ACER | M190EN02 | BN07-00170B | AMZ | | "AU 19"" ZPD code derivation (ZPD)" |
| ACER | M170EN06 | BN07-00171A | ATH | | "AU Monitor 17"" New panel development" |
| ACER | T260XW01 | BN07-00163A | AMZ | | "AU 26"" new panel developm |
| (NF26EO)" | | | | | |
| ACER | A201SN01 | BN07-00177A | ATZ | | "AU TV panel 20.1"" TN SVGA new panel development" |
| ACER | M170EN06 | BN07-00171B | ATZ | | "AU Monitor 17"" ZPD code Derivation |
| ACER | T315XW01 | BN07-00194A | AMZ | | AU 32" new |
| ACER | M170EG01 | BN07-00192A | ATH | | AU TN PSWG type new Panel code |
| ACER | M170EG01 | BN07-00192B | ATZ | | AU TN PSWG type NEW panel code derivation |
| | | | | | |
| CHIMEI | M170E3-LO1 | BN07-00050A | CA | | TN PANEL |
| CHIMEI | M150X3-L01 | BN07-00051A | CB | | COMPATIBLE |
| CHIMEI | M170E4-L01 | BN07-00052A | CC | | MVA PANEL |
| CHIMEI | M150X2-L01 | BN07-00066A | CD | | CHIME 15"I PVA PANEL |
| CHIMEI | M150X3-L01 | BN07-00079A | CE | | Chimei ZPD panel |
| CHIMEI | M170E3-L01 | BN07-00103A | CF | | ZPD Panel code |
| CHIMEI | M170E4-L01 | BN07-00104A | CG | | ZPD Panel code |
| CHIMEI | V296W1-L01 | BN07-00120A | CH | | MVA |
| CHIMEI | M170E6-L02 | BN07-00126A | CJ | | HIGHLAND 17" LOW PANEL |
| CHIMEI | M190E2-L01 | BN07-00131A | CK | | GH19AS,BS CHIMEI PANEL |
| CHIMEI | M150X4-L06 | BN07-00137A | CL | | 15" Narrow & Slim panel |
| CHIMEI | M170E6-L01 | BN07-00133A | CM | | "2003-03-11 vendor change" |
| CHIMEI | M170E6-L01 | BN07-00133B | CN | | "ZPD derivation panel" |
| CHIMEI | V201V1-T01 | BN07-00135A | CP | | "CHIMEI 20.1"" panel development" |
| CHIMEI | M170E6-L02 | BN07-00126B | CQ | | "HIGHLAND 17"" LOW PANEL ZPD derivation panel" |
| CHIMEI | M170E6-L05 | BN07-00152A | CR | | "CMO 17"" new panel development code" |
| CHIMEI | M170E6-L05 | BN07-00152B | CS | | "CMO 17"" ZPD panel code derivation" |
| CHIMEI | M150X4-L06 | BN07-00137B | CT | | Chimei 15" Narrow & Slim panel ZPD derivation |
| CHIMEI | M170E5-L05 | BN07-00165A | CTH | | CMO 17" new panel development code (GOYA2-PJT) |
| CHIMEI | M170E5-L05 | BN07-00165B | CTZ | | CMO 17" ZPD panel(GOYA2-PJT) |

# Memo

# 2 Product Specifications

## 2-1 Fashion Feature

-. Minimalism Design Something New

-. Boltless Model (Clean Cut & Soft Surface)

-. New Ball Hinge

-. Color Variation. White, Black

## 2-2 LS17PEA Specifications

| Item | Description |
|---|---|
| LCD Panel | TFT-LCD panel, RGB vertical stripe, normally black transmissive,<br>17-Inch viewable, 0.264 (H) x 0.264 (V) mm pixel pitch |
| Scanning Frequency | Horizontal : 31 kHz ~ 81 kHz (Automatic)<br>Vertical : 56 Hz ~ 75 Hz (UXGA : 60 Hz) |
| Display Colors | 16.7 Million colors |
| Maximum Resolution | Horizontal : 1280 Pixels<br>Vertical : 1024 Pixels |
| Input Signal | Analog |
| Input Sync Signal | Seperate H/V sync, Composite H/V, Sync-on-Green, Automatic synchroniza tion whitout external swith of sync type<br><br>Level : TTL level |
| Maximum Pixel Clock rate | 135 MHz |
| Active Display<br>Horizontal/Vertical | 337(H) x 270(W) mm |
| AC power voltage & Frequency | AC 90 ~ 264 Volts, 60/50 Hz |
| Power Consumption | 34W (Max) |
| Dimensions<br>Set (W x D x H) | 376.0 x 177.0 x 380.0 mm |
| Weight (Set/Package) | 3.2kg / 4.3kg |
| Environmental Considerations | Operating Temperature : 0˚F ~ 122˚F (0℃ ~ 50℃)<br>Operating Humidity : 20% ~ 90%<br>Storage temperature : -4˚F ~ 149˚F (-20℃ ~ 65℃)<br>Storage Humidity : 5% ~ 90% |
| - Designs and specifications are subject to change without prior notice. | |

## 2-3 LS19PEB Specifications

| Item | Description |
|---|---|
| LCD Panel | TFT-LCD panel, RGB vertical stripe, normally black transmissive,<br>19-Inch viewable, 0.294 (H) x 0.294 (V) mm pixel pitch |
| Scanning Frequency | Horizontal : 31 kHz ~ 81 kHz (Automatic)<br>Vertical : 56 Hz ~ 75 Hz (UXGA : 60 Hz) |
| Display Colors | 16.7 Million colors |
| Maximum Resolution | Horizontal : 1280 Pixels<br>Vertical : 1024 Pixels |
| Input Signal | Analog / Digital |
| Input Sync Signal | Seperate H/V sync, Composite H/V, Sync-on-Green, Automatic synchroniza tion whitout external swith of sync type<br><br>Level : TTL level |
| Maximum Pixel Clock rate | 135 MHz |
| Active Display<br>Horizontal/Vertical | 376.3(H) x 301.05(W) mm |
| AC power voltage & Frequency | AC 90 ~ 264 Volts, 60/50 Hz |
| Power Consumption | 38W (Max) |
| Dimensions<br>Set (W x D x H) | 418.0 x 199.0 x 418.0 mm |
| Weight (Set/Package) | 4.0kg / 5.3kg |
| Environmental Considerations | Operating Temperature : 0˚F ~ 122˚F (0℃ ~ 50℃)<br>Operating Humidity : 20% ~ 90%<br>Storage temperature : -4˚F ~ 149˚F (-20℃ ~ 65℃)<br>Storage Humidity : 5% ~ 90% |
| - Designs and specifications are subject to change without prior notice. | |

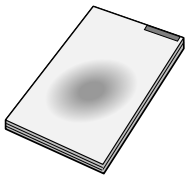
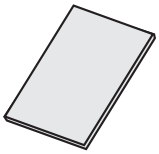
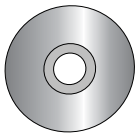
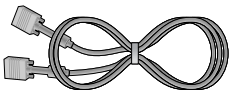
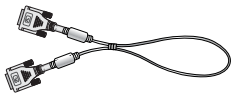
## 2-4 LS19PEA Specifications

| Item | Description |
|---|---|
| LCD Panel | TFT-LCD panel, RGB vertical stripe, normally black transmissive,<br>19-Inch viewable, 0.294 (H) x 0.294 (V) mm pixel pitch |
| Scanning Frequency | Horizontal : 31 kHz ~ 81 kHz (Automatic)<br>Vertical : 56 Hz ~ 75 Hz (UXGA : 60 Hz) |
| Display Colors | 16.7 Million colors |
| Maximum Resolution | Horizontal : 1280 Pixels<br>Vertical : 1024 Pixels |
| Input Signal | Analog |
| Input Sync Signal | Seperate H/V sync, Composite H/V, Sync-on-Green, Automatic synchroniza tion whitout external swith of sync type<br><br>Level : TTL level |
| Maximum Pixel Clock rate | 135 MHz |
| Active Display<br>Horizontal/Vertical | 376.3(H) x 301.05(W) mm |
| AC power voltage & Frequency | AC 90 ~ 264 Volts, 60/50 Hz |
| Power Consumption | 38W (Max) |
| Dimensions<br>Set (W x D x H) | 418.0 x 199.0 x 418.0 mm |
| Weight (Set/Package) | 4.0kg / 5.3kg |
| Environmental Considerations | Operating Temperature : 0˚F ~ 122˚F (0℃ ~ 50℃)<br>Operating Humidity : 20% ~ 90%<br>Storage temperature : -4˚F ~ 149˚F (-20℃ ~ 65℃)<br>Storage Humidity : 5% ~ 90% |
| - Designs and specifications are subject to change without prior notice. | |

## 2-5 Spec Comparison

| Model | BI17BS / 19BS | LS17PEA / LS19PEA / LS19PEB |
|---|---|---|
| **Design** | | |
| **Frequency**<br>**Horizontal**<br>**Vertical**<br>**Display Color** | <br>30 ~ 81 kHz<br>60 ~ 75 Hz<br>16,2M colors | <br>30 ~ 81 kHz<br>60 ~ 75 Hz<br>16,7M colors |
| **PC Resolution**<br>**Maximum mode** | <br>1280 x 1024 / 60 Hz | <br>1280 x 1024 / 60 Hz |
| **Input Signal**<br>**Sync Signal**<br>**Video Signal** | <br>H/V Separate, TTL, P. or N.<br>0.7 Vp-p @ 75ohm | <br>H/V Separate, TTL, P. or N.<br>0.7 Vp-p @ 75ohm |
| **Power Consumption**<br>**Normal**<br>**Power Saving** | <br>34W / 38W<br>< 1W | <br>34W / 38W<br>< 1W |
| **Response Time** | 8ms | 17" : 5ms<br>19" : 5ms |
| **Anion Option** | None | None |
| **Magic Color** | Support | Support (Deleted Magic Zone) |

## 2-6 Option Specification

| Item | Item Name | CODE.NO | Remark |
|---|---|---|---|
|  | Quick Setup Guide | BN68-01002C | |
|  | Warranty Card<br>(Not available in all locations) | AA68-00371C | |
|  | User's Guide,<br>Monitor Driver,<br>Natural Color software,<br>MagicTune™ software | LS17PEA, LS19PEB:<br>BN59-00585A<br><br>LS19PEA:<br>BN59-00585L | |
|  | D-Sub(15 Pin)<br>Cable | BN39-00244B | |
| | Power Cord | 3903-000042 | |
|  | DVI Cable | BN39-00246F | Sold separately |

## Memo

# 3 Alignments and Adjustments

This section of the service manual explains how to use the DDC MANAGER JIG.
This function is needed for AD board change and program memory (IC110) change.

## 3-1 Required Equipment

The following equipment is necessary for adjusting the monitor:

- Computer with Windows 95, Windows 98, or Windows NT.
- MTI-2031 DDC MANAGER JIG

## 3-2 Automatic Color Adjustment

To input video, use 16 gray or any pattern using black and white.

1. Select english for OSD language.
2. Press the " ↵ (Enter/Source)" key for 5 seconds.

## 3-3 DDC EDID Data Input

1. Input DDC EDID data when replacing AD PCB.
2. Receive/Download the proper DDC file for the model from HQ quality control department.
   Install the below jig (Figure 1) and enter the data.

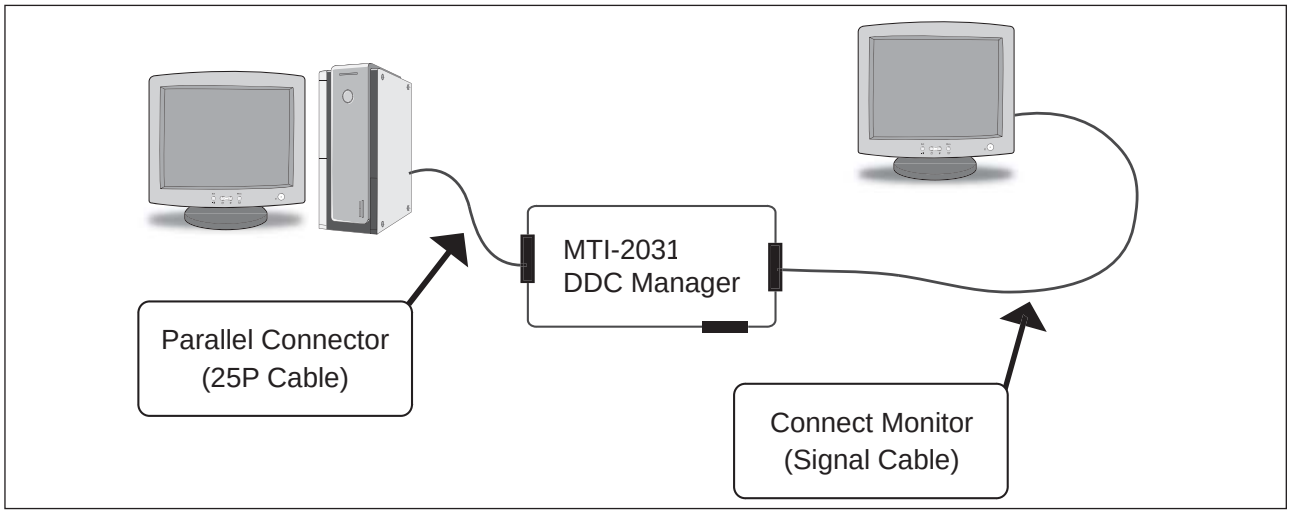



Figure 1.

## 3-4 OSD Adjustment When Replacing Panel

1. Adjust brightness and contrast to 0. Then, press the ↵ (Enter/Source) key for 5 seconds.
   Service function OSD will appear on screen.
2. Press the + key to place the cursor on the panel. Press the menu key for 5 seconds.

## 3-5 OSD Adjustment When Replacing Lamp Only

1. Adjust brightness and contrast to 0. Then, press the exit key for 5 seconds.
   Service function OSD will appear on the screen.
2. Press the + key. Select upper lamp and press the menu key for 5 seconds.
   Then, select lower lamp and press the menu key for 5 seconds.

***-Note :** Please be sure to read the following instructions for details on service function.*

# 3-6 Service Function Spec.

## 3-6-1 How to Display Service Function OSD

1. The value for brightness and contrast should be changed to zero.
2. Within 5 seconds, press the ↵ (Enter/Source) key.
3. Service function OSD will be displayed.

-If you want to disable the service function OSD, you will have to power off.

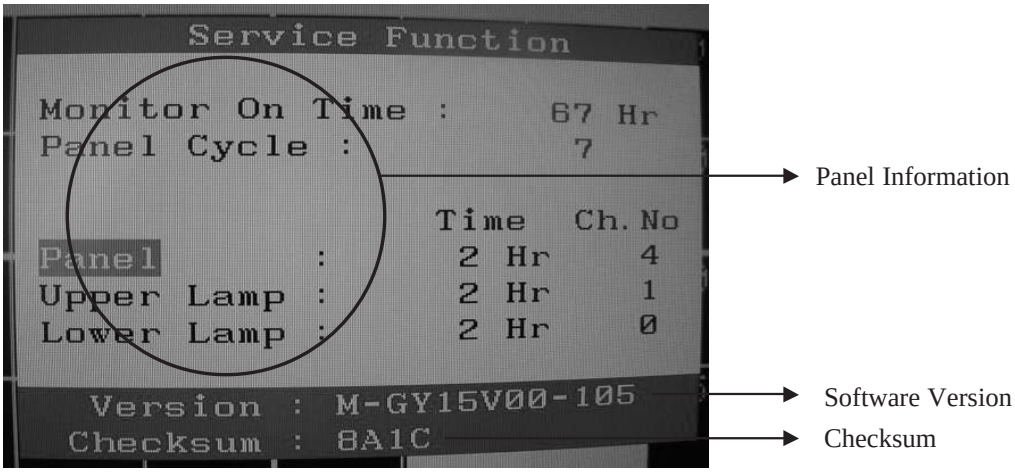



Figure 2. The example of service function OSD

The service function OSD is based on a grid of 29 columns x 12 rows.
The service function OSD consists of panel information, software version and MICOM checksum.

## 3-6-2 How to Control Service Function OSD

1. With the panel selected on OSD, whenever you press the right key, the base color will change to blue from "Panel" to "Upper Lamp", "Lower Lamp".

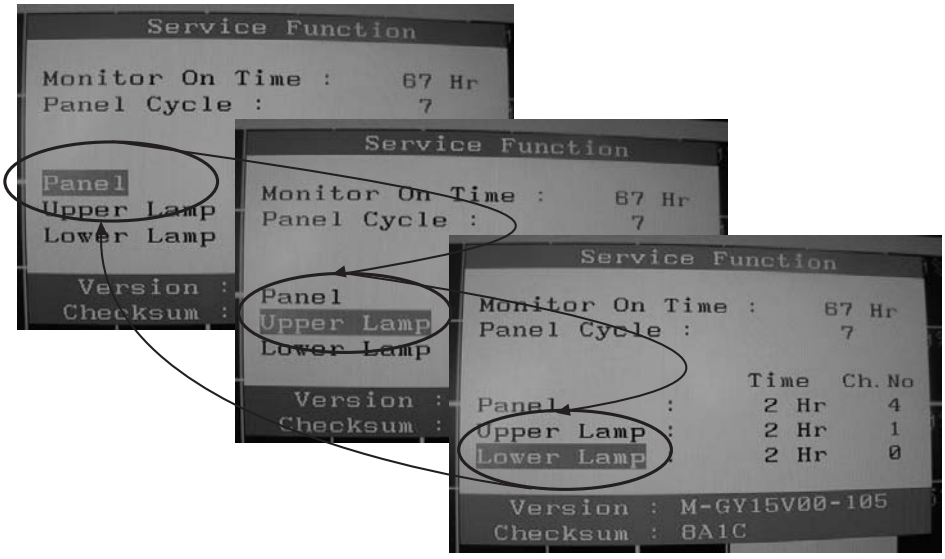



Figure 3.

## 3-6-3 How to Control Service Function OSD

**-After changing the panel or lamp, you must reset service function OSD.**

**-The case of panel change**

After changing the panel, press the menu key within 5 seconds,.
Then, panel Ch. No increases one step and the panel time information is reset to zero.
Simultaneously, other information is reset to zero (Upper/Lower lamp, Panel cycle).

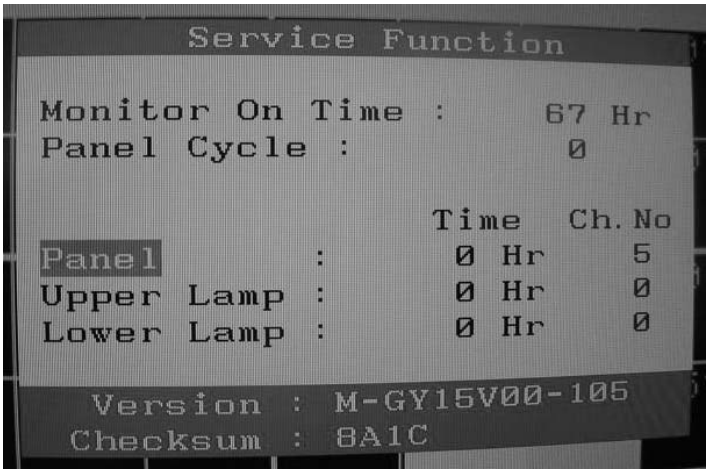

Service Function
Monitor On Time : 67 Hr
Panel Cycle : 0
Time Ch. No
Panel : 0 Hr 5
Upper Lamp : 0 Hr 0
Lower Lamp : 0 Hr 0
Version : M-GY15V00-105
Checksum : 8A1C

Figure 4.

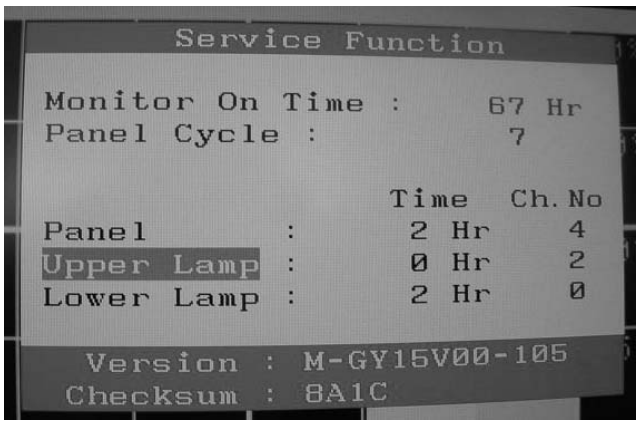
## 3-6-4 How to Control Service Function OSD

**-In the case of Upper Lamp or Lower Lamp change**

After changing the Upper Lamp or Lower Lamp,

1. Select the Upper Lamp or Lower Lamp
2. Press the Menu key within an 5 seconds.

Then, Ch. No and time will be reset to zero (selected item only).


Service Function
Monitor On Time : 67 Hr
Panel Cycle : 7
Time Ch. No
Panel : 2 Hr 4
Upper Lamp : 0 Hr 2
Lower Lamp : 2 Hr 0
Version : M-GY15V00-105
Checksum : 8A1C

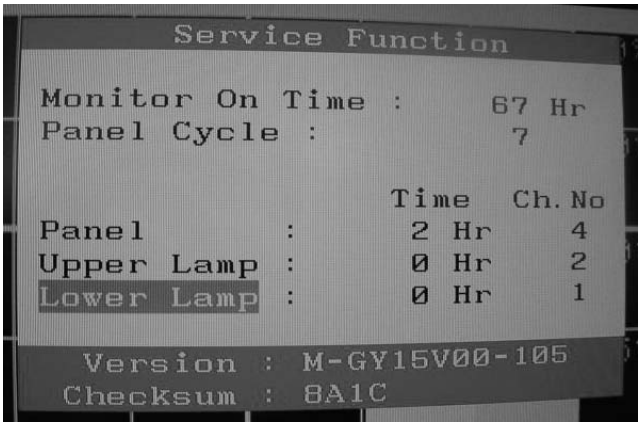
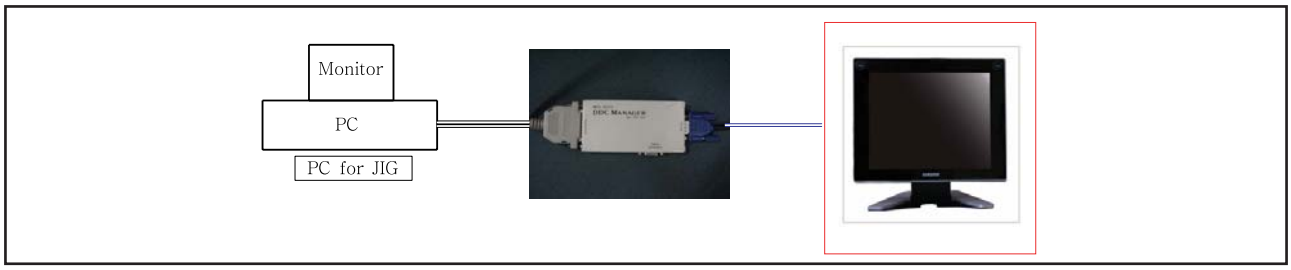

Service Function
Monitor On Time : 67 Hr
Panel Cycle : 7
Time Ch. No
Panel : 2 Hr 4
Upper Lamp : 0 Hr 2
Lower Lamp : 0 Hr 1
Version : M-GY15V00-105
Checksum : 8A1C

Figure 5, 6.

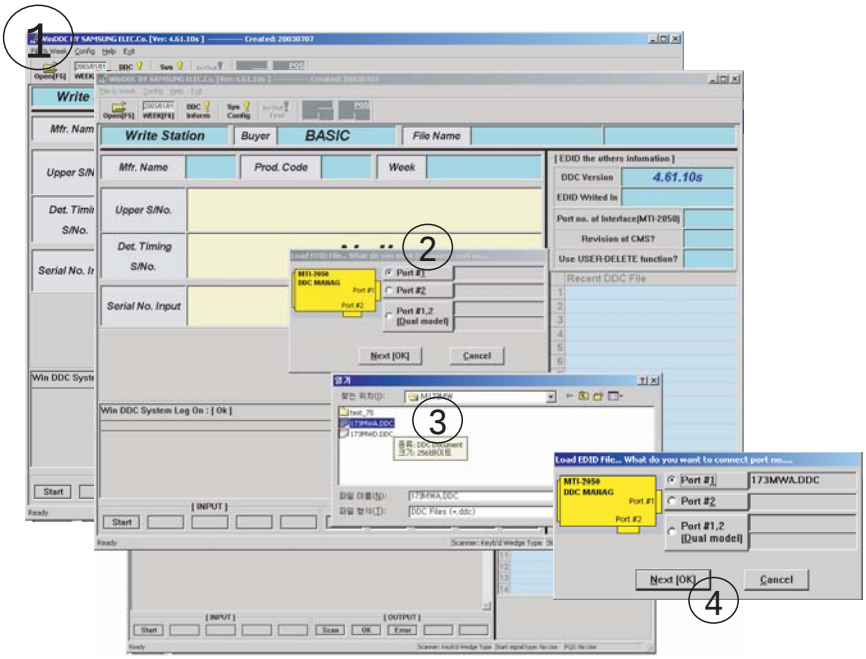
# 3-7 How to execute DDC

## 3-7-1 After exchange the Main PBA, confirm below items

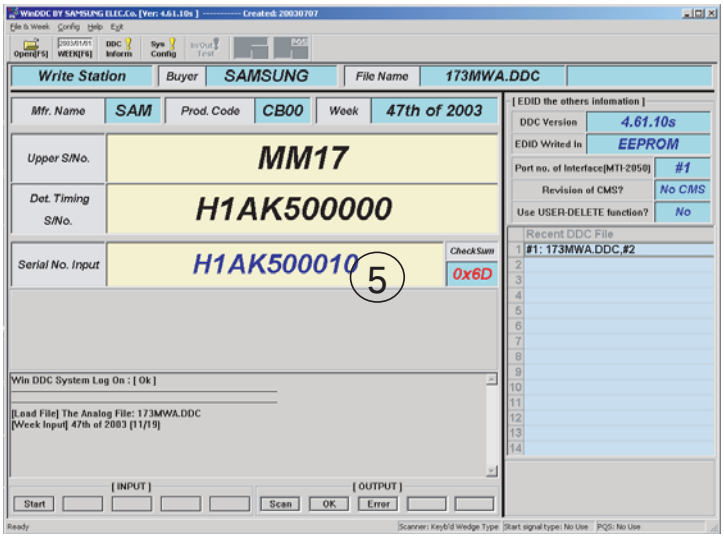
1. PC color status check (Auto Color)
2. EDID Input (Analog and Digital)
3. Check the MCU Code
   (After change MCU Code, Do Auto color )
4. Factory Reset




1) Run DDC Manager MTI-2050.
2) Select a DDC file name.
   Progtam : WinDDC BY SAMSUNG ELEC.Co. [Ver:4.65.12V] --- Modify : 20050425
   DDC : 732N.ddc or 932B.ddc
3) Insert into DDC Manager Port 1 (analog) and make the DDC input as for the old dual model.
4) Insert into DDC Manager Port 2 (Digital) and make the DDC input.




1. Open file.
2. Select Port #1.
3. Select DDC file.
4. Click, "Next" Button

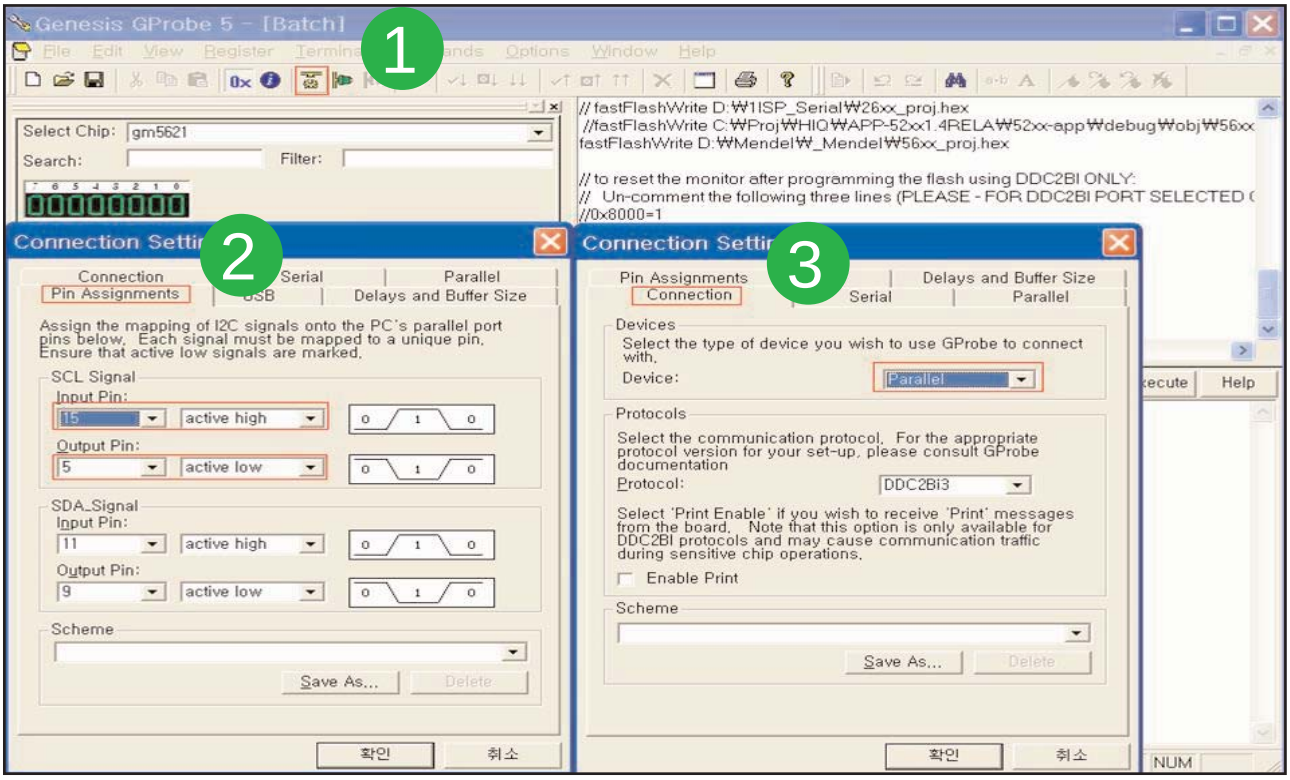



5. Type in the monitor serial number and press Enter.

*Repeat this step 2 to 5 times in digital inputs after the analog input.

## 3-8 How to execute MCU Code

### 3-8-1 Program Setting - Config Setting

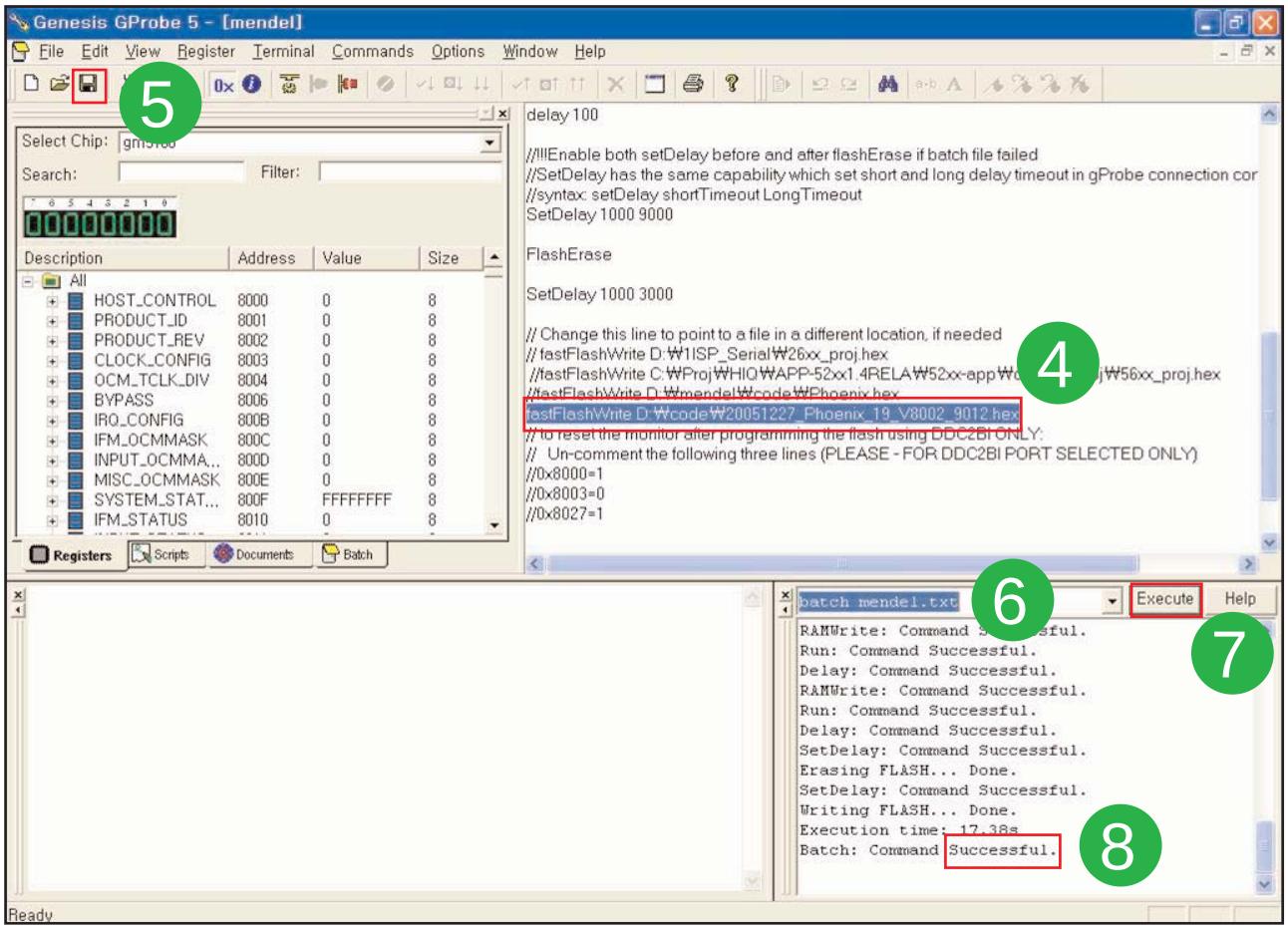



1. Click Config Setting

2. Change SCL Signal at Pin Assignments

3. Set Device to Parallel

## 3-8-2 Change Batch File Path and DownLoad Code




4. Change the Code's Path to saved Path at your PC.

5. Save the Batch file.

6. Write Batch command
   "batch batch file name.txt"

7. Click "Execute" Button

8. If command is "Successful" , Hard Power On/Off until LED is Off

**- If command is "Error",**

1. Hard Power Off

2. Write Command "forcesa"

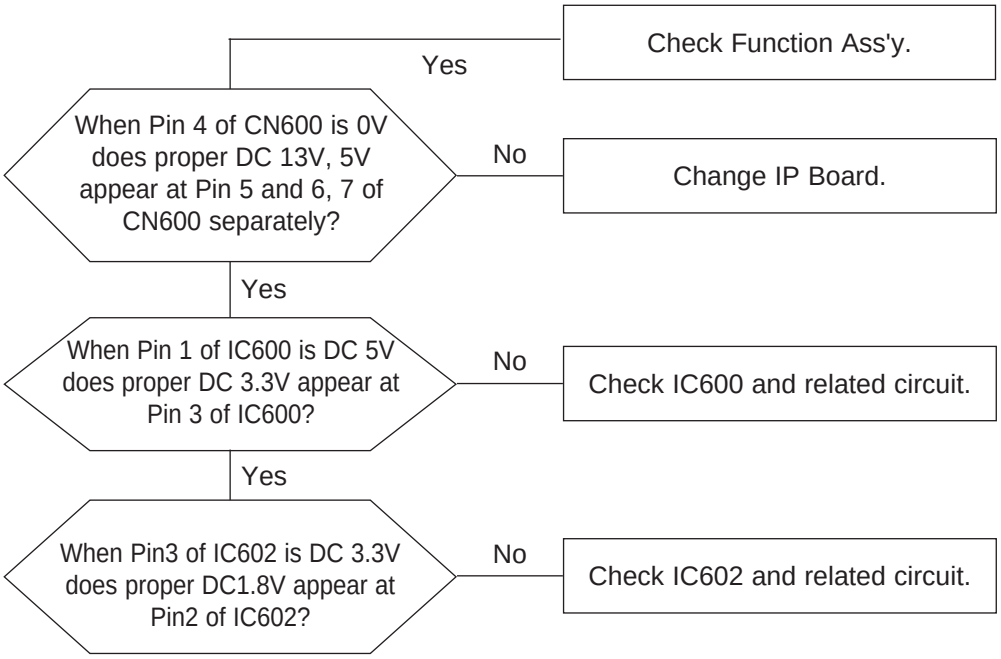
3. Click "Execute" Button

4. Repeat again 7 to 9.

# 4 Troubleshooting

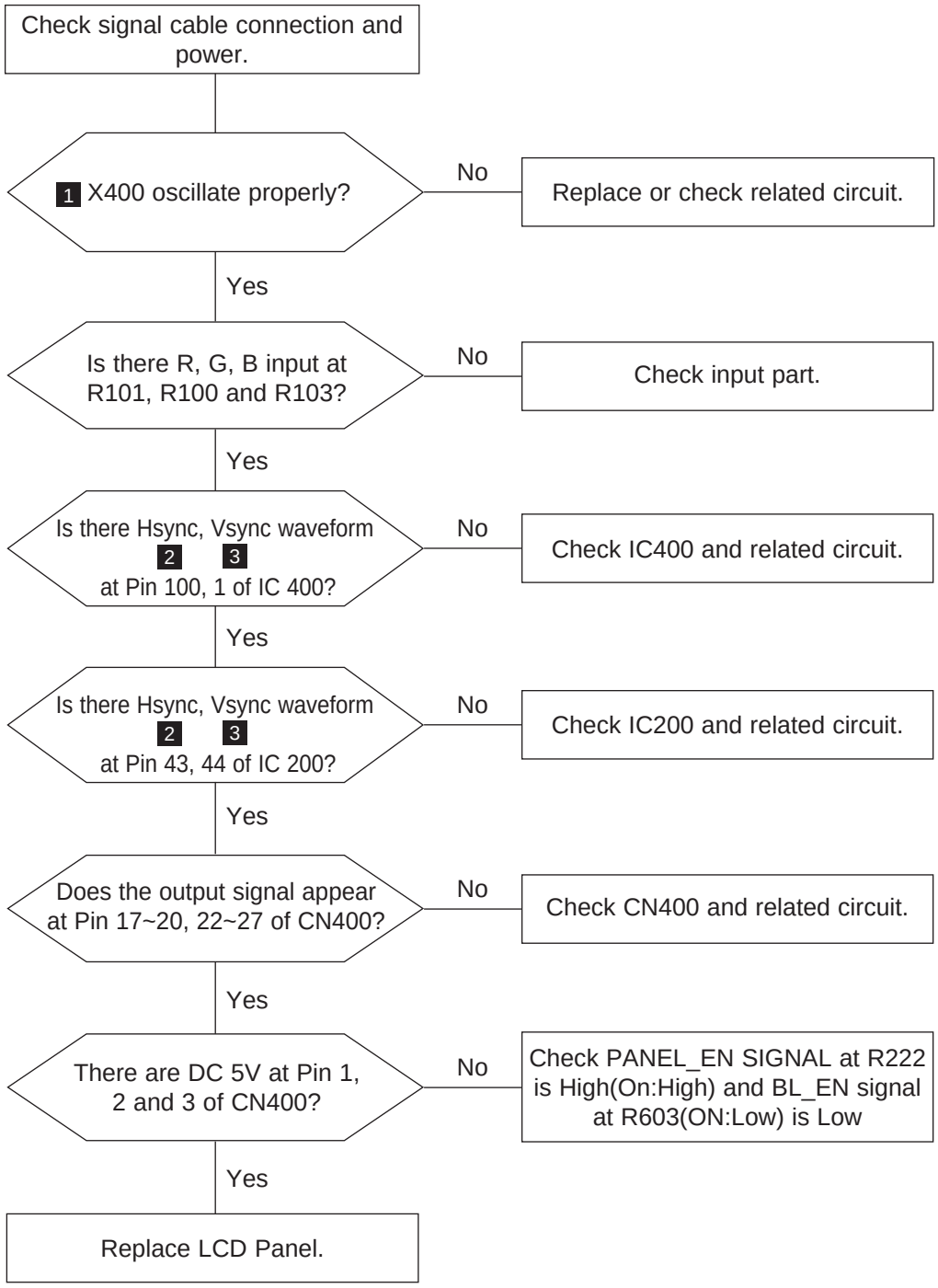
Notes:
1. Before troubleshooting, setup the PC 's display as below.
   - Resolution: 1024 x 768
   - H-frequency: 61 kHz
   - V-frequency: 75 Hz
2. If no picture appears, make sure the power cord is correctly connected.
3. Check the following circuits.
   - No raster appears: Function PBA, Main PBA, I/P PBA
   - 5V develop but no screen: Main PBA
   - 5V does not develop: I/P PBA
4. If you push and hold the "↵ (Enter/Source)" button for more than 5 seconds, the monitor automatically returns to the factory preset.

## 4-1 No Power (17", 19")


When Pin 4 of CN600 is 0V does proper DC 13V, 5V appear at Pin 5 and 6, 7 of CN600 separately?
Yes
Check Function Ass'y.
No
Change IP Board.
When Pin 1 of IC600 is DC 5V does proper DC 3.3V appear at Pin 3 of IC600?
Yes
No
Check IC600 and related circuit.
When Pin3 of IC602 is DC 3.3V does proper DC1.8V appear at Pin2 of IC602?
Yes
No
Check IC602 and related circuit.

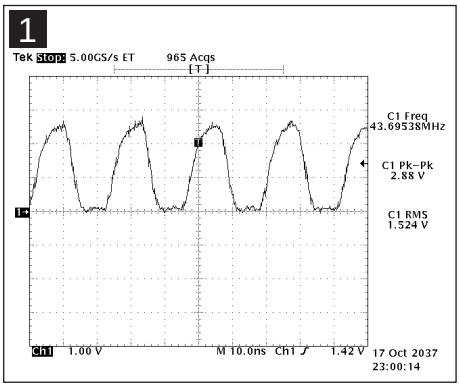
* All locations of this page includes Main PBA.

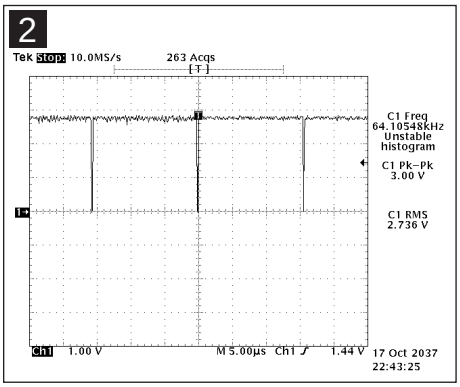
# 4-2 No Video (ANALOG 17", 19")

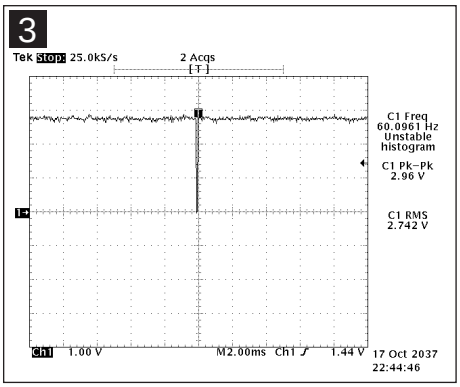

Check signal cable connection and power.
1 X400 oscillate properly?
No
Replace or check related circuit.
Yes
Is there R, G, B input at R101, R100 and R103?
No
Check input part.
Yes
Is there Hsync, Vsync waveform 2 3 at Pin 100, 1 of IC 400?
No
Check IC400 and related circuit.
Yes
Is there Hsync, Vsync waveform 2 3 at Pin 43, 44 of IC 200?
No
Check IC200 and related circuit.
Yes
Does the output signal appear at Pin 17~20, 22~27 of CN400?
No
Check CN400 and related circuit.
Yes
There are DC 5V at Pin 1, 2 and 3 of CN400?
No
Check PANEL_EN SIGNAL at R222 is High(On:High) and BL_EN signal at R603(ON:Low) is Low
Yes
Replace LCD Panel.

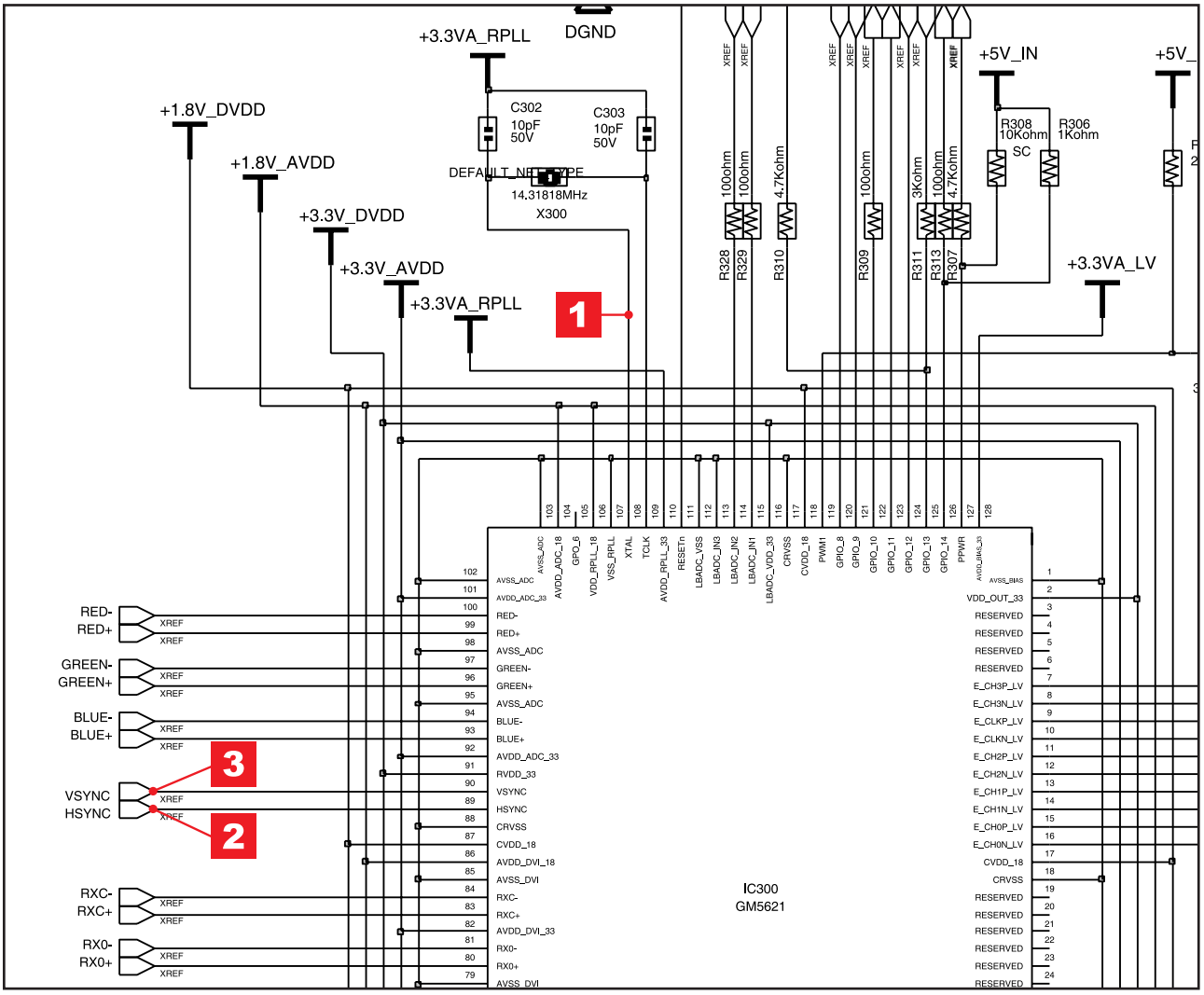
* All locations of this page includes Main PBA.

# WAVEFORMS

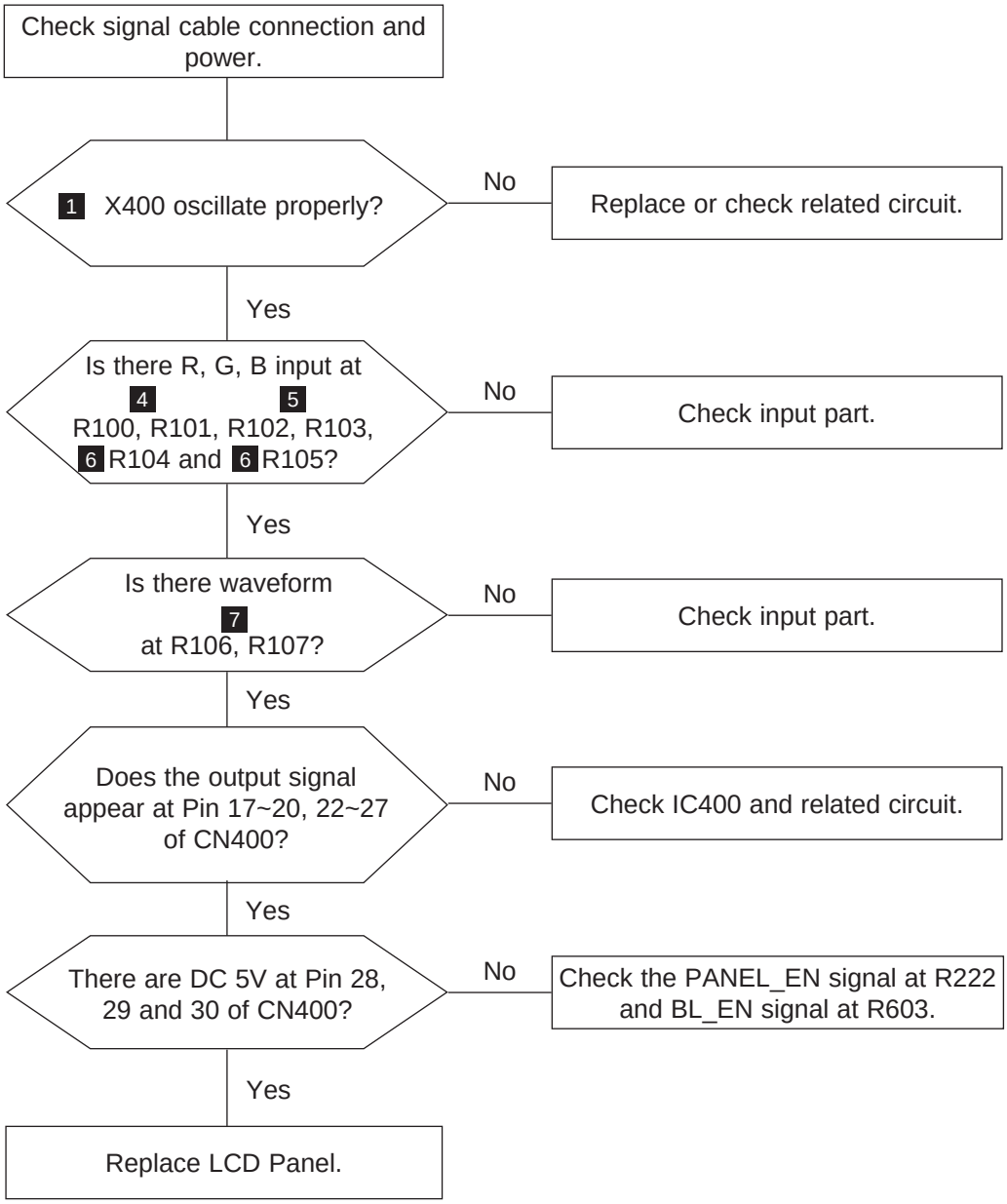

1
Tek Stop: 5.00GS/s ET 965 Acqs
C1 Freq 43.69538MHz
C1 Pk-Pk 2.88 V
C1 RMS 1.524 V
Ch1 1.00 V M 10.0ns Ch1 1.42 V 17 Oct 2037 23:00:14


2
Tek Stop: 10.0MS/s 263 Acqs
C1 Freq 64.10548kHz Unstable histogram
C1 Pk-Pk 3.00 V
C1 RMS 2.736 V
Ch1 1.00 V M 5.00µs Ch1 1.44 V 17 Oct 2037 22:43:25


3
Tek Stop: 25.0kS/s 2 Acqs
C1 Freq 60.0961 Hz Unstable histogram
C1 Pk-Pk 2.96 V
C1 RMS 2.742 V
Ch1 1.00 V M2.00ms Ch1 1.44 V 17 Oct 2037 22:44:46


+3.3VA_RPLL
DGND
+1.8V_DVDD
+1.8V_AVDD
+3.3V_DVDD
+3.3V_AVDD
+3.3VA_RPLL
C302 10pF 50V
C303 10pF 50V
14.31818MHz
X300
+5V_IN
R308 10Kohm
R306 1Kohm
SC
+3.3VA_LV
R328 100ohm
R329 100ohm
R310 4.7Kohm
R309 100ohm
R311 3Kohm
R313 100ohm
R307 4.7Kohm
1
2
3
RED-
RED+
GREEN-
GREEN+
BLUE-
BLUE+
VSYNC
HSYNC
RXC-
RXC+
RX0-
RX0+
XREF
IC300
GM5621

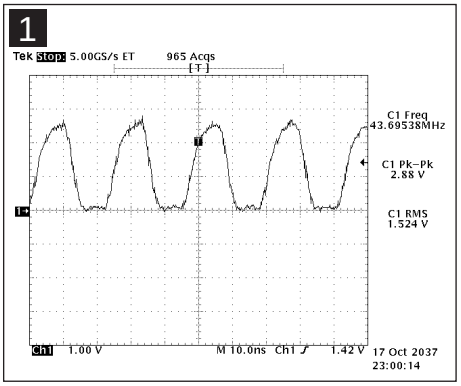
# 4-3 No Video (DIGITAL LS19PEB)


Check signal cable connection and power.
1 X400 oscillate properly?
No
Replace or check related circuit.
Yes
Is there R, G, B input at 4 5 R100, R101, R102, R103, 6 R104 and 6 R105?
No
Check input part.
Yes
Is there waveform 7 at R106, R107?
No
Check input part.
Yes
Does the output signal appear at Pin 17~20, 22~27 of CN400?
No
Check IC400 and related circuit.
Yes
There are DC 5V at Pin 28, 29 and 30 of CN400?
No
Check the PANEL_EN signal at R222 and BL_EN signal at R603.
Yes
Replace LCD Panel.

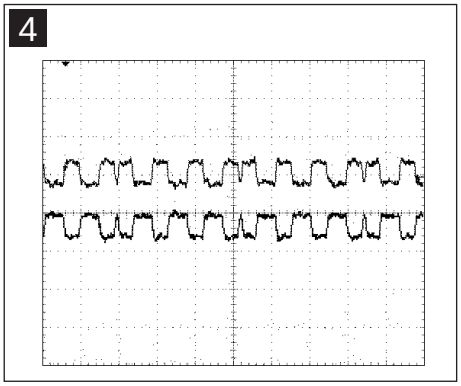
* All locations of this page includes Main PBA.

# WAVEFORMS

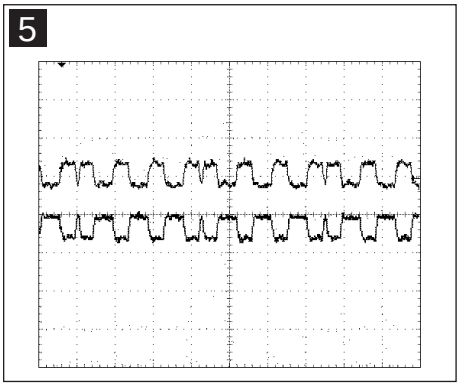
1



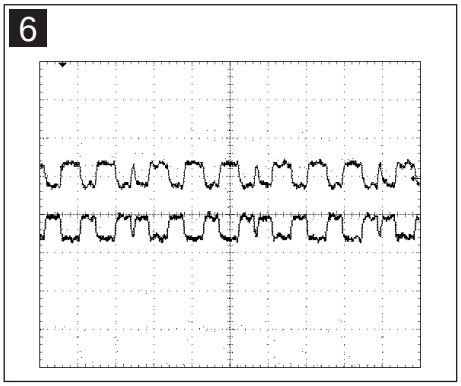

4



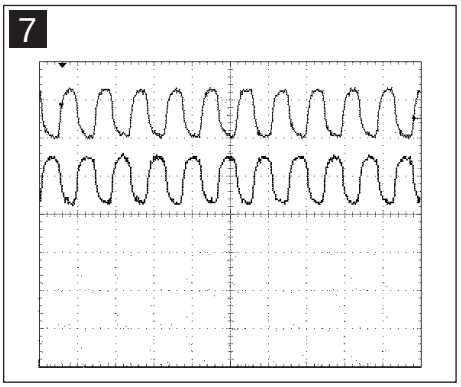
5

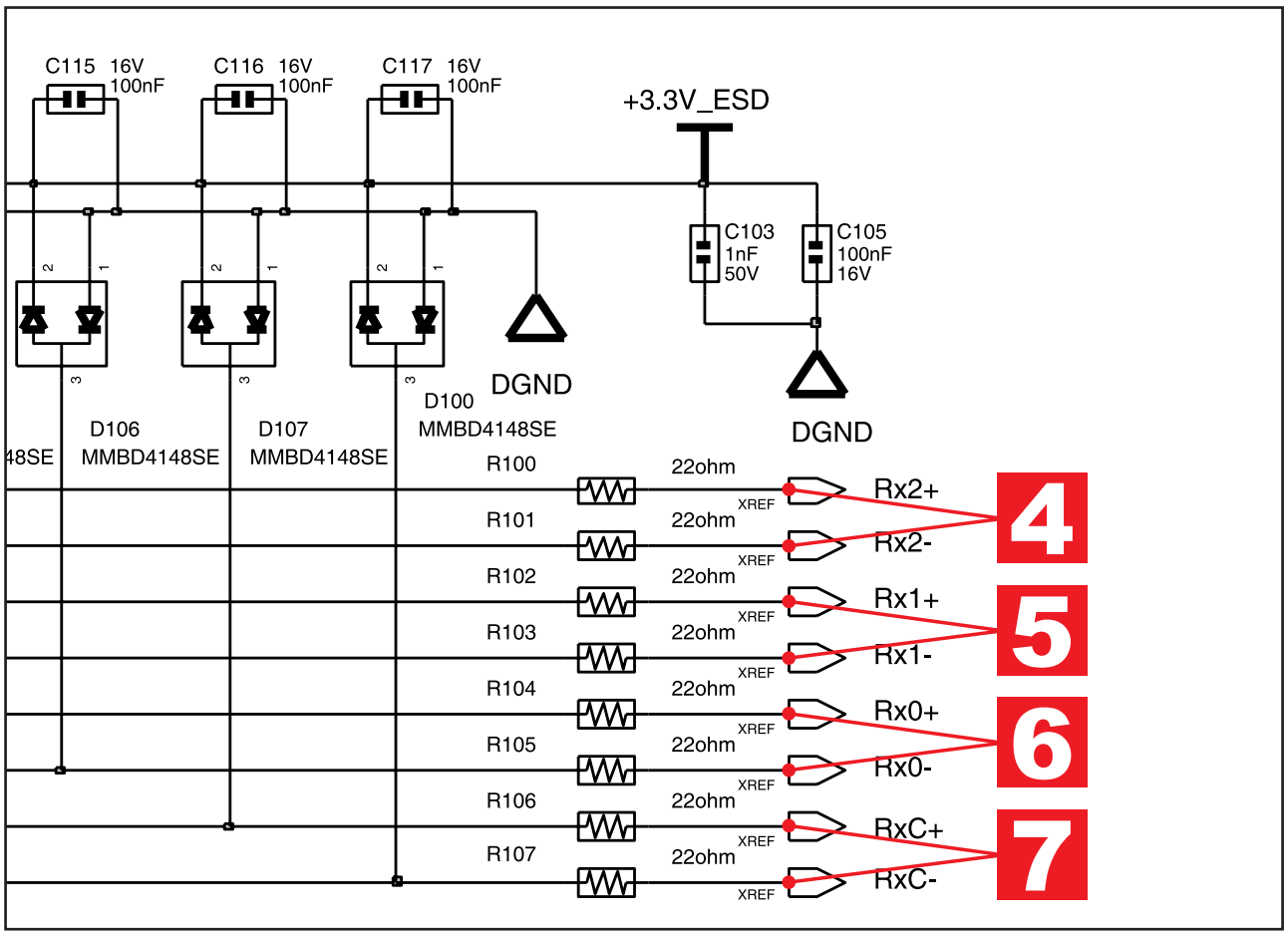


6



7

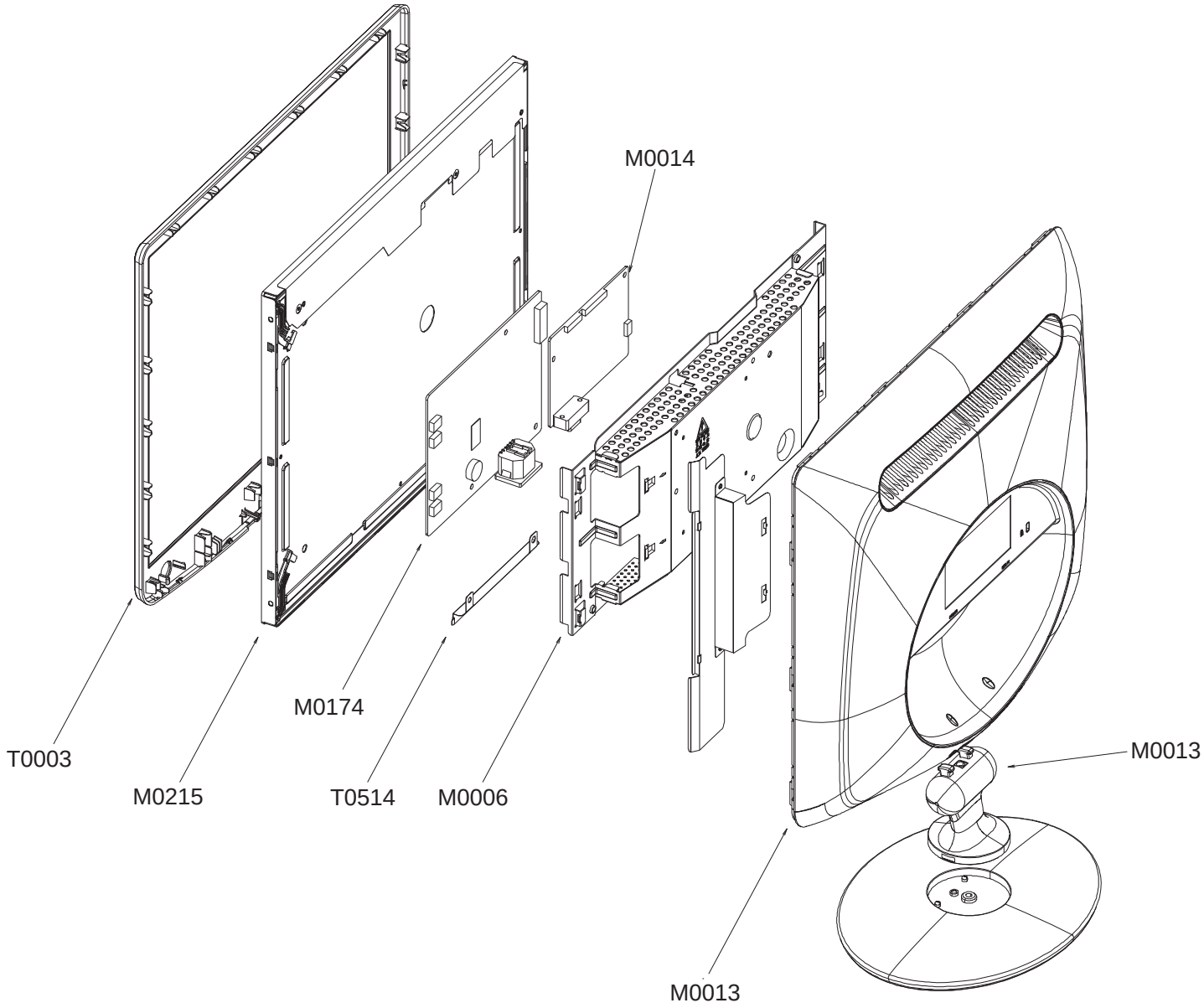



C115 16V 100nF
C116 16V 100nF
C117 16V 100nF
+3.3V_ESD
C103 1nF 50V
C105 100nF 16V
DGND
DGND
D100 MMBD4148SE
D106 MMBD4148SE
D107 MMBD4148SE
R100
R101
R102
R103
R104
R105
R106
R107
22ohm
XREF
Rx2+
Rx2-
Rx1+
Rx1-
Rx0+
Rx0-
RxC+
RxC-
4
5
6
7

# 5 Exploded View and Parts List

-You can search for updated part codes through ITSELF web site.
URL : http://itself. sec. samsung.co.kr

## 5-1 LS19PEBSBE/EDC Exploded View



## 5-2 Parts List

| Location | Code.No | Item & Specification | Q'ty | SA/SNA | Remark |
|---|---|---|---|---|---|
| T0003 | BN96-04142Q | ASSY COVER P-FRONT;LS19PE (932B),HSD Pan | 1 | S.A | |
| M0215 | BN07-00474A | LCD-PANEL;M190EG02 V4,Haydn,6bit Hi-FRC, | 1 | S.A | |
| M0174 | BN44-00124J | IP BOARD;IP-35155A(PV),Pebble,3.0 ~5.0mA | 1 | S.A | |
| M0014 | BN94-01300M | ASSY PCB MAIN-SEDA,FUCHION PCB;PABBLE* | 1 | S.N.A | |
| T0514 | BN61-02784A | BRACKET-SUPPORT;PEBBLE,SPTE,0.3 | 1 | S.N.A | |
| M0006 | BN96-04145A | ASSY SHIELD P-COVER;PEBBLE19,SECC,T0.8 | 1 | S.N.A | |
| M0013 | BN96-06492A | ASSY COVER P-REAR;LS19PE(AUO),,ABS HB,,B | 1 | S.A | |
| M0013 | BN96-04150D | ASSY STAND P-BAR;-,PEBBLE17,-,ABS HB,BK2 | 1 | S.A | |

# 6 Electrical Parts List

## 6-1 LS19PEBSBE/EDC Parts List

| Level | Loc. No. | Code No. | Description & Specification | Q'ty | SA/SNA | Remark |
|---|---|---|---|---|---|---|
| | | LS19PEBSBE/EDC | 932B,SAB3/S19P0-LPE,19,LCD-MO,NETHERLAND | | | |
| 0.1 | M0001 | BN90-01055J | ASSY COVER FRONT;LS19PE (932B),HSD,BLACK | 1 | S.N.A | |
| ..2 | T0003 | BN96-04142Q | ASSY COVER P-FRONT;LS19PE (932B),HSD Pan | 1 | S.A | |
| ...3 | M0081 | 6003-000282 | SCREW-TAPTITE;BH,+,-,B,M3,L8,ZPC(BLK),SW | 2 | S.A | |
| ...3 | | BN61-03222A | GUIDE-PANEL;LS17PEW,SECC,T 0.5 | 1 | S.N.A | |
| ...3 | CCM1 | BN63-02183D | COVER-SHEET;Rhcm,PE Vinyl,T0.05,680mm,20 | 0.45 | S.N.A | |
| ...3 | M0112 | BN63-02878D | COVER-FRONT;LS19PE (S/M932B),ABS,2.4,HB, | 1 | S.N.A | |
| ...3 | T0022 | BN64-00534B | KNOB CONTROL;PEBBLE,ABS,HB,BK26 | 1 | S.N.A | |
| ...3 | T0023 | BN64-00597B | KNOB POWER;PEBBLE,black highglossy | 1 | S.N.A | |
| ...3 | M0130 | BN67-00193A | LENS LED;PEBBLE,ABS HB,CLR | 1 | S.N.A | |
| ...3 | M0145 | BN96-04363A | ASSY BOARD P-FUCNTION;Pebble,SJ06-01-023 | 1 | S.A | |
| ....4 | M0014 | BN94-01300M | ASSY PCB MAIN-SEDA,FUCHION PCB;PABBLE* | 1 | S.N.A | |
| .....5 | M2893 | BN39-00774A | LEAD CONNECTOR;Pebble,UL1061#28,UL/CSA,3 | 1 | S.A | |
| .....5 | M2893 | BN39-00788A | LEAD CONNECTOR;Pebble,UL1061#28,4PIN,300 | 1 | S.A | |
| .....5 | T0238 | BN97-01597B | ASSY AUTO;PEBBLE* | 1 | S.N.A | |
| ......6 | T0313 | 3404-000299 | SWITCH-TACT;12V,50mA,120gf,6x6x4.3mm,SPS | 5 | S.A | |
| ......6 | T0174 | BN97-01589M | ASSY SMD;PABBLE | 1 | S.N.A | |
| .......7 | R110 | 2007-000122 | R-CHIP;1.2Kohm,5%,1/10W,TP,1608 | 1 | S.A | |
| .......7 | R110 | 2007-000122 | R-CHIP;1.2Kohm,5%,1/10W,TP,1608 | 1 | S.A | |
| .......7 | R110 | 2007-000123 | R-CHIP;1.5Kohm,5%,1/10W,TP,1608 | 1 | S.A | |
| .......7 | R110 | 2007-000123 | R-CHIP;1.5Kohm,5%,1/10W,TP,1608 | 1 | S.A | |
| .......7 | R110 | 2007-001157 | R-CHIP;750ohm,5%,1/10W,TP,1608 | 4 | S.A | |
| .......7 | R110 | 2007-001157 | R-CHIP;750ohm,5%,1/10W,TP,1608 | 1 | S.A | |
| .......7 | R110 | 2007-001157 | R-CHIP;750ohm,5%,1/10W,TP,1608 | 1 | S.A | |
| .......7 | R110 | 2007-001157 | R-CHIP;750ohm,5%,1/10W,TP,1608 | 1 | S.A | |
| .......7 | C120 | 2203-000189 | C-CER,CHIP;100nF,+80-20%,25V,Y5V,1608 | 3 | S.A | |
| .......7 | C120 | 2203-000189 | C-CER,CHIP;100nF,+80-20%,25V,Y5V,1608 | 1 | S.A | |
| .......7 | C120 | 2203-000189 | C-CER,CHIP;100nF,+80-20%,25V,Y5V,1608 | 1 | S.A | |
| .......7 | PCB | BN41-00793B | PCB SUB-FUNCTION;Pebble,FR-1,1,1.1,1.6,8 | 1 | S.N.A | |
| ....4 | | BN94-01310C | ASSY PCB MISC-SEDA,POWER,BN96-;PABBLE | 1 | S.N.A | |
| .....5 | L0405 | 0601-001896 | LED;SMD,BLUE,1.6x0.8x0.4mm,470,1.6x0.8x0 | 1 | S.A | |
| .....5 | L0405 | 0601-001896 | LED;SMD,BLUE,1.6x0.8x0.4mm,470,1.6x0.8x0 | 1 | S.A | |
| .....5 | L0405 | 0601-001896 | LED;SMD,BLUE,1.6x0.8x0.4mm,470,1.6x0.8x0 | 1 | S.A | |
| .....5 | L0405 | 0601-001896 | LED;SMD,BLUE,1.6x0.8x0.4mm,470,1.6x0.8x0 | 1 | S.A | |
| .....5 | T0313 | 3404-001207 | SWITCH-TACT;12V,50mA,160gf,6.2X6.2,SPST | 1 | S.A | |
| .....5 | SUBPCB | BN41-00791A | PCB SUB-POWER;Pebble,FR-1,1,1.0,1.6,36*1 | 1 | S.N.A | |
| 0.1 | M0002 | BN90-01423A | ASSY COVER REAR;LS19PEBSBE,BLACK_AUO | 1 | S.N.A | |
| ..2 | M0013 | BN96-06492A | ASSY COVER P-REAR;LS19PE(AUO),,ABS HB,,B | 1 | S.A | |
| ...3 | M0081 | 6003-001003 | SCREW-TAPTITE;BH,+,B,M4,L12,ZPC(BLK),SWR | 4 | S.N.A | |
| ...3 | T0060 | BN61-02830A | SPRING ETC;PEBBLE,SK5,1.0,LS19PEB,HRC 45 | 1 | S.N.A | |
| ...3 | CCM1 | BN63-02183D | COVER-SHEET;Rhcm,PE Vinyl,T0.05,680mm,20 | 0.45 | S.N.A | |
| ...3 | M0014 | BN63-02880B | COVER-STAND BAR;PEBBLE,ABS HB,T2.6,BK26, | 1 | S.N.A | |
| ...3 | | BN63-02883B | COVER-HINGE;PEBBLE,ABS HB,T2.6,BK26,HF-0 | 1 | S.N.A | |
| ...3 | M0006 | BN63-04083A | COVER-REAR;PEBBLE 19",ABS,2.6,HB,BK26 | 1 | S.N.A | |
| ...3 | T0102 | BN73-00132B | RUBBER-CAP;PEBBLE,ELASTOMER,BK07,HB | 1 | S.N.A | |
| 0.1 | M0112 | BN91-01212A | ASSY SHIELD;LS19PEBSW/EDC | 1 | S.N.A | |
| ..2 | | BN63-02887A | SHIELD-LAMP;PEBBLE,SPTE,0.3,19INCH | 1 | S.N.A | |
| 0.1 | | BN91-01803G | ASSY LCD-ATZ;LS19PEB* | 1 | S.N.A | |

| Level | Loc. No. | Code No. | Description & Specification | Q'ty | SA/SNA | Remark |
|---|---|---|---|---|---|---|
| ..2 | M0215 | BN07-00474A | LCD-PANEL;M190EG02 V4,Haydn,6bit Hi-FRC, | 1 | S.A | |
| 0.1 | M0017 | BN91-01890H | ASSY CHASSIS-ATZ,W/W;LS19PEBSB(W)*,932B | 1 | S.A | |
| ..2 | M0081 | 6003-000282 | SCREW-TAPTITE;BH,+,-,B,M3,L8,ZPC(BLK),SW | 1 | S.A | |
| ..2 | M0081 | 6003-000282 | SCREW-TAPTITE;BH,+,-,B,M3,L8,ZPC(BLK),SW | 3 | S.A | |
| ..2 | M0081 | 6003-001439 | SCREW-TAPTITE;BH,+,-,S,M4,L8,ZPC(WHT),SW | 1 | S.N.A | |
| ..2 | T0562 | 6046-001013 | STAND OFF;M3,L5,Ni PLT,SUM24L,#4-40 | 4 | S.N.A | |
| ..2 | M0174 | BN44-00124J | IP BOARD;IP-35155A(PV),Pebble,3.0 ~5.0mA | 1 | S.A | |
| ..2 | T0514 | BN61-02784A | BRACKET-SUPPORT;PEBBLE,SPTE,0.3 | 1 | S.N.A | |
| ..2 | M0014 | BN94-01559M | ASSY PCB MAIN-ATZ,W/W;LS19PEBSB(W)*,932B | 1 | S.N.A | |
| ...3 | T0245 | 0202-001492 | SOLDER-WIRE FLUX;HSE-02 LFM48 SR-34 S,-, | 0.003 | S.N.A | |
| ...3 | CN102 | 3701-001173 | CONNECTOR-DVI;24P,3R,FEMALE,ANGLE,AUF | 1 | S.A | |
| ...3 | CN101 | 3701-001219 | CONNECTOR-DSUB;15P,3R,FEMALE,ANGLE,AUF | 1 | S.A | |
| ...3 | T0174 | BN97-01876K | ASSY SMD;LS19PEB* | 1 | S.N.A | |
| ....4 | SUB05 | 0202-001477 | SOLDER-CREAM;LST309-M,-,D20~45§-,96.5Sn/ | 0.673 | S.N.A | |
| ....4 | D100 | 0401-001056 | DIODE-SWITCHING;MMBD4148SE,100V,200mA,SO | 1 | S.A | |
| ....4 | D101 | 0401-001056 | DIODE-SWITCHING;MMBD4148SE,100V,200mA,SO | 1 | S.A | |
| ....4 | D102 | 0401-001056 | DIODE-SWITCHING;MMBD4148SE,100V,200mA,SO | 1 | S.A | |
| ....4 | D103 | 0401-001056 | DIODE-SWITCHING;MMBD4148SE,100V,200mA,SO | 1 | S.A | |
| ....4 | D104 | 0401-001056 | DIODE-SWITCHING;MMBD4148SE,100V,200mA,SO | 1 | S.A | |
| ....4 | D105 | 0401-001056 | DIODE-SWITCHING;MMBD4148SE,100V,200mA,SO | 1 | S.A | |
| ....4 | D106 | 0401-001056 | DIODE-SWITCHING;MMBD4148SE,100V,200mA,SO | 1 | S.A | |
| ....4 | D107 | 0401-001056 | DIODE-SWITCHING;MMBD4148SE,100V,200mA,SO | 1 | S.A | |
| ....4 | D108 | 0401-001056 | DIODE-SWITCHING;MMBD4148SE,100V,200mA,SO | 1 | S.A | |
| ....4 | D110 | 0401-001056 | DIODE-SWITCHING;MMBD4148SE,100V,200mA,SO | 1 | S.A | |
| ....4 | D125 | 0401-001056 | DIODE-SWITCHING;MMBD4148SE,100V,200mA,SO | 1 | S.A | |
| ....4 | D126 | 0401-001056 | DIODE-SWITCHING;MMBD4148SE,100V,200mA,SO | 1 | S.A | |
| ....4 | D127 | 0401-001056 | DIODE-SWITCHING;MMBD4148SE,100V,200mA,SO | 1 | S.A | |
| ....4 | D109 | 0403-001411 | DIODE-ZENER;-,5.49-5.73V,200mW,SOD-323,T | 1 | S.A | |
| ....4 | D123 | 0403-001411 | DIODE-ZENER;-,5.49-5.73V,200mW,SOD-323,T | 1 | S.A | |
| ....4 | D124 | 0403-001411 | DIODE-ZENER;-,5.49-5.73V,200mW,SOD-323,T | 1 | S.A | |
| ....4 | D128 | 0403-001411 | DIODE-ZENER;-,5.49-5.73V,200mW,SOD-323,T | 1 | S.A | |
| ....4 | D129 | 0403-001411 | DIODE-ZENER;-,5.49-5.73V,200mW,SOD-323,T | 1 | S.A | |
| ....4 | D220 | 0403-001411 | DIODE-ZENER;-,5.49-5.73V,200mW,SOD-323,T | 1 | S.A | |
| ....4 | D230 | 0403-001411 | DIODE-ZENER;-,5.49-5.73V,200mW,SOD-323,T | 1 | S.A | |
| ....4 | D231 | 0403-001411 | DIODE-ZENER;-,5.49-5.73V,200mW,SOD-323,T | 1 | S.A | |
| ....4 | D221 | 0406-001061 | DIODE-TVS;MMQA5V6T3,5.32/5.6/5.88V,24W,S | 1 | S.A | |
| ....4 | D232 | 0406-001061 | DIODE-TVS;MMQA5V6T3,5.32/5.6/5.88V,24W,S | 1 | S.A | |
| ....4 | ZD200 | 0406-001061 | DIODE-TVS;MMQA5V6T3,5.32/5.6/5.88V,24W,S | 1 | S.A | |
| ....4 | Q201 | 0501-000445 | TR-SMALL SIGNAL;KTC3875S-Y,NPN,150mW,SOT | 1 | S.A | |
| ....4 | Q302 | 0501-002080 | TR-SMALL SIGNAL;2SC2412K,NPN,200mW,SC-59 | 1 | S.A | |
| ....4 | Q409 | 0505-001957 | FET-SILICON;NTR2101P,P,-8V,-3.7A,0.052oh | 1 | S.A | |
| ....4 | IC112 | 1103-000129 | IC-EEPROM;24C02,2Kbit,256x8Bit,SOP,8P,5x | 1 | S.A | |
| ....4 | IC112 | 1103-000129 | IC-EEPROM;24C02,2Kbit,256x8Bit,SOP,8P,5x | 1 | S.A | |
| ....4 | IC112 | 1103-001023 | IC-EEPROM;24C08,8Kbit,1Kx8Bit,SOP,8P,5x4 | 1 | S.A | |
| ....4 | IC303 | 1203-001212 | IC-VOL. DETECTOR;7029,SOT-89,3P,-,PLASTI | 1 | S.A | |
| ....4 | T0087 | 1203-003060 | IC-POSI.FIXED REG.;AP1084,TO-263,3P,9.97 | 1 | S.A | |
| ....4 | T0087 | 1203-003696 | IC-POSI.FIXED REG.;NCP1117DT18T5G,DPAK,3 | 1 | S.A | |
| ....4 | IC109 | 1205-002899 | IC-LCD CONTROLLER;GM5726-LF-AA,PQFP,128P | 1 | S.A | |
| ....4 | R110 | 2007-000070 | R-CHIP;0ohm,5%,1/10W,TP,1608 | 1 | S.A | |
| ....4 | R110 | 2007-000071 | R-CHIP;22ohm,5%,1/10W,TP,1608 | 1 | S.A | |
| ....4 | R110 | 2007-000071 | R-CHIP;22ohm,5%,1/10W,TP,1608 | 1 | S.A | |
| ....4 | R110 | 2007-000071 | R-CHIP;22ohm,5%,1/10W,TP,1608 | 1 | S.A | |
| ....4 | R110 | 2007-000071 | R-CHIP;22ohm,5%,1/10W,TP,1608 | 1 | S.A | |
| ....4 | R110 | 2007-000071 | R-CHIP;22ohm,5%,1/10W,TP,1608 | 1 | S.A | |

| Level | Loc. No. | Code No. | Description & Specification | Q'ty | SA/SNA | Remark |
|---|---|---|---|---|---|---|
| ....4 | R110 | 2007-000071 | R-CHIP;22ohm,5%,1/10W,TP,1608 | 1 | S.A | |
| ....4 | R110 | 2007-000071 | R-CHIP;22ohm,5%,1/10W,TP,1608 | 1 | S.A | |
| ....4 | R110 | 2007-000071 | R-CHIP;22ohm,5%,1/10W,TP,1608 | 1 | S.A | |
| ....4 | R110 | 2007-000071 | R-CHIP;22ohm,5%,1/10W,TP,1608 | 1 | S.A | |
| ....4 | R110 | 2007-000071 | R-CHIP;22ohm,5%,1/10W,TP,1608 | 1 | S.A | |
| ....4 | R110 | 2007-000071 | R-CHIP;22ohm,5%,1/10W,TP,1608 | 1 | S.A | |
| ....4 | R110 | 2007-000071 | R-CHIP;22ohm,5%,1/10W,TP,1608 | 1 | S.A | |
| ....4 | R110 | 2007-000074 | R-CHIP;100ohm,5%,1/10W,TP,1608 | 1 | S.A | |
| ....4 | R110 | 2007-000074 | R-CHIP;100ohm,5%,1/10W,TP,1608 | 1 | S.A | |
| ....4 | R110 | 2007-000074 | R-CHIP;100ohm,5%,1/10W,TP,1608 | 1 | S.A | |
| ....4 | R110 | 2007-000074 | R-CHIP;100ohm,5%,1/10W,TP,1608 | 1 | S.A | |
| ....4 | R110 | 2007-000074 | R-CHIP;100ohm,5%,1/10W,TP,1608 | 1 | S.A | |
| ....4 | R110 | 2007-000074 | R-CHIP;100ohm,5%,1/10W,TP,1608 | 1 | S.A | |
| ....4 | R110 | 2007-000074 | R-CHIP;100ohm,5%,1/10W,TP,1608 | 1 | S.A | |
| ....4 | R110 | 2007-000074 | R-CHIP;100ohm,5%,1/10W,TP,1608 | 1 | S.A | |
| ....4 | R110 | 2007-000074 | R-CHIP;100ohm,5%,1/10W,TP,1608 | 1 | S.A | |
| ....4 | R110 | 2007-000074 | R-CHIP;100ohm,5%,1/10W,TP,1608 | 1 | S.A | |
| ....4 | R110 | 2007-000074 | R-CHIP;100ohm,5%,1/10W,TP,1608 | 1 | S.A | |
| ....4 | R110 | 2007-000074 | R-CHIP;100ohm,5%,1/10W,TP,1608 | 1 | S.A | |
| ....4 | R110 | 2007-000074 | R-CHIP;100ohm,5%,1/10W,TP,1608 | 1 | S.A | |
| ....4 | R110 | 2007-000074 | R-CHIP;100ohm,5%,1/10W,TP,1608 | 1 | S.A | |
| ....4 | R110 | 2007-000074 | R-CHIP;100ohm,5%,1/10W,TP,1608 | 1 | S.A | |
| ....4 | R110 | 2007-000074 | R-CHIP;100ohm,5%,1/10W,TP,1608 | 1 | S.A | |
| ....4 | R110 | 2007-000074 | R-CHIP;100ohm,5%,1/10W,TP,1608 | 1 | S.A | |
| ....4 | R110 | 2007-000074 | R-CHIP;100ohm,5%,1/10W,TP,1608 | 1 | S.A | |
| ....4 | R110 | 2007-000074 | R-CHIP;100ohm,5%,1/10W,TP,1608 | 1 | S.A | |
| ....4 | R110 | 2007-000074 | R-CHIP;100ohm,5%,1/10W,TP,1608 | 1 | S.A | |
| ....4 | R110 | 2007-000078 | R-CHIP;1Kohm,5%,1/10W,TP,1608 | 1 | S.A | |
| ....4 | R110 | 2007-000078 | R-CHIP;1Kohm,5%,1/10W,TP,1608 | 1 | S.A | |
| ....4 | R110 | 2007-000080 | R-CHIP;2Kohm,5%,1/10W,TP,1608 | 1 | S.A | |
| ....4 | R110 | 2007-000080 | R-CHIP;2Kohm,5%,1/10W,TP,1608 | 1 | S.A | |
| ....4 | R110 | 2007-000082 | R-CHIP;3.3Kohm,5%,1/10W,TP,1608 | 1 | S.A | |
| ....4 | R110 | 2007-000082 | R-CHIP;3.3Kohm,5%,1/10W,TP,1608 | 1 | S.A | |
| ....4 | R110 | 2007-000083 | R-CHIP;3Kohm,5%,1/10W,TP,1608 | 1 | S.A | |
| ....4 | R110 | 2007-000083 | R-CHIP;3Kohm,5%,1/10W,TP,1608 | 1 | S.A | |
| ....4 | R110 | 2007-000083 | R-CHIP;3Kohm,5%,1/10W,TP,1608 | 1 | S.A | |
| ....4 | R110 | 2007-000084 | R-CHIP;4.7Kohm,5%,1/10W,TP,1608 | 1 | S.A | |
| ....4 | R110 | 2007-000084 | R-CHIP;4.7Kohm,5%,1/10W,TP,1608 | 1 | S.A | |
| ....4 | R110 | 2007-000084 | R-CHIP;4.7Kohm,5%,1/10W,TP,1608 | 1 | S.A | |
| ....4 | R110 | 2007-000084 | R-CHIP;4.7Kohm,5%,1/10W,TP,1608 | 1 | S.A | |
| ....4 | R110 | 2007-000084 | R-CHIP;4.7Kohm,5%,1/10W,TP,1608 | 1 | S.A | |
| ....4 | R110 | 2007-000084 | R-CHIP;4.7Kohm,5%,1/10W,TP,1608 | 1 | S.A | |
| ....4 | R110 | 2007-000084 | R-CHIP;4.7Kohm,5%,1/10W,TP,1608 | 1 | S.A | |
| ....4 | R110 | 2007-000084 | R-CHIP;4.7Kohm,5%,1/10W,TP,1608 | 1 | S.A | |
| ....4 | R110 | 2007-000084 | R-CHIP;4.7Kohm,5%,1/10W,TP,1608 | 1 | S.A | |
| ....4 | R110 | 2007-000090 | R-CHIP;10Kohm,5%,1/10W,TP,1608 | 1 | S.A | |
| ....4 | R110 | 2007-000090 | R-CHIP;10Kohm,5%,1/10W,TP,1608 | 1 | S.A | |
| ....4 | R110 | 2007-000090 | R-CHIP;10Kohm,5%,1/10W,TP,1608 | 1 | S.A | |
| ....4 | R110 | 2007-000090 | R-CHIP;10Kohm,5%,1/10W,TP,1608 | 1 | S.A | |
| ....4 | R110 | 2007-000090 | R-CHIP;10Kohm,5%,1/10W,TP,1608 | 1 | S.A | |
| ....4 | R110 | 2007-000090 | R-CHIP;10Kohm,5%,1/10W,TP,1608 | 1 | S.A | |
| ....4 | R110 | 2007-000090 | R-CHIP;10Kohm,5%,1/10W,TP,1608 | 1 | S.A | |
| ....4 | R110 | 2007-000090 | R-CHIP;10Kohm,5%,1/10W,TP,1608 | 1 | S.A | |
| ....4 | R110 | 2007-000090 | R-CHIP;10Kohm,5%,1/10W,TP,1608 | 1 | S.A | |

| Level | Loc. No. | Code No. | Description & Specification | Q'ty | SA/SNA | Remark |
|---|---|---|---|---|---|---|
| ....4 | R110 | 2007-000090 | R-CHIP;10Kohm,5%,1/10W,TP,1608 | 1 | S.A | |
| ....4 | R110 | 2007-000090 | R-CHIP;10Kohm,5%,1/10W,TP,1608 | 1 | S.A | |
| ....4 | R110 | 2007-000090 | R-CHIP;10Kohm,5%,1/10W,TP,1608 | 1 | S.A | |
| ....4 | R110 | 2007-000090 | R-CHIP;10Kohm,5%,1/10W,TP,1608 | 1 | S.A | |
| ....4 | R110 | 2007-000090 | R-CHIP;10Kohm,5%,1/10W,TP,1608 | 1 | S.A | |
| ....4 | R110 | 2007-000092 | R-CHIP;15Kohm,5%,1/10W,TP,1608 | 1 | S.A | |
| ....4 | R110 | 2007-000092 | R-CHIP;15Kohm,5%,1/10W,TP,1608 | 1 | S.A | |
| ....4 | R110 | 2007-000092 | R-CHIP;15Kohm,5%,1/10W,TP,1608 | 1 | S.A | |
| ....4 | R110 | 2007-000102 | R-CHIP;100Kohm,5%,1/10W,TP,1608 | 1 | S.A | |
| ....4 | R110 | 2007-000124 | R-CHIP;2.2Kohm,5%,1/10W,TP,1608 | 1 | S.A | |
| ....4 | R110 | 2007-000608 | R-CHIP;240ohm,5%,1/10W,TP,1608 | 1 | S.A | |
| ....4 | R110 | 2007-001002 | R-CHIP;510ohm,5%,1/10W,TP,1608 | 1 | S.A | |
| ....4 | R110 | 2007-001164 | R-CHIP;75ohm,1%,1/10W,TP,1608 | 1 | S.A | |
| ....4 | R110 | 2007-001164 | R-CHIP;75ohm,1%,1/10W,TP,1608 | 1 | S.A | |
| ....4 | R110 | 2007-001164 | R-CHIP;75ohm,1%,1/10W,TP,1608 | 1 | S.A | |
| ....4 | C120 | 2203-000041 | C-CER,CHIP;0.01nF,0.25pF,50V,C0G,1608 | 1 | S.A | |
| ....4 | C120 | 2203-000041 | C-CER,CHIP;0.01nF,0.25pF,50V,C0G,1608 | 1 | S.A | |
| ....4 | C120 | 2203-000189 | C-CER,CHIP;100nF,+80-20%,25V,Y5V,1608 | 1 | S.A | |
| ....4 | C120 | 2203-000257 | C-CER,CHIP;10nF,10%,50V,X7R,TP,1608 | 1 | S.A | |
| ....4 | C120 | 2203-000257 | C-CER,CHIP;10nF,10%,50V,X7R,TP,1608 | 1 | S.A | |
| ....4 | C120 | 2203-000257 | C-CER,CHIP;10nF,10%,50V,X7R,TP,1608 | 1 | S.A | |
| ....4 | C120 | 2203-000257 | C-CER,CHIP;10nF,10%,50V,X7R,TP,1608 | 1 | S.A | |
| ....4 | C120 | 2203-000257 | C-CER,CHIP;10nF,10%,50V,X7R,TP,1608 | 1 | S.A | |
| ....4 | C120 | 2203-000257 | C-CER,CHIP;10nF,10%,50V,X7R,TP,1608 | 1 | S.A | |
| ....4 | C120 | 2203-000257 | C-CER,CHIP;10nF,10%,50V,X7R,TP,1608 | 1 | S.A | |
| ....4 | C120 | 2203-000257 | C-CER,CHIP;10nF,10%,50V,X7R,TP,1608 | 1 | S.A | |
| ....4 | C120 | 2203-000257 | C-CER,CHIP;10nF,10%,50V,X7R,TP,1608 | 1 | S.A | |
| ....4 | C120 | 2203-000440 | C-CER,CHIP;1nF,10%,50V,X7R,1608 | 1 | S.A | |
| ....4 | C120 | 2203-000872 | C-CER,CHIP;0.0030nF,0.25pF,50V,C0G,1608 | 1 | S.A | |
| ....4 | C120 | 2203-000872 | C-CER,CHIP;0.0030nF,0.25pF,50V,C0G,1608 | 1 | S.A | |
| ....4 | C120 | 2203-000872 | C-CER,CHIP;0.0030nF,0.25pF,50V,C0G,1608 | 1 | S.A | |
| ....4 | C120 | 2203-001652 | C-CER,CHIP;470nF,+80-20%,16V,Y5V,1608 | 1 | S.A | |
| ....4 | C120 | 2203-005005 | C-CER,CHIP;100nF,10%,16V,X7R,1608 | 1 | S.A | |
| ....4 | C120 | 2203-005005 | C-CER,CHIP;100nF,10%,16V,X7R,1608 | 1 | S.A | |
| ....4 | C120 | 2203-005005 | C-CER,CHIP;100nF,10%,16V,X7R,1608 | 1 | S.A | |
| ....4 | C120 | 2203-005005 | C-CER,CHIP;100nF,10%,16V,X7R,1608 | 1 | S.A | |
| ....4 | C120 | 2203-005005 | C-CER,CHIP;100nF,10%,16V,X7R,1608 | 1 | S.A | |
| ....4 | C120 | 2203-005005 | C-CER,CHIP;100nF,10%,16V,X7R,1608 | 1 | S.A | |
| ....4 | C120 | 2203-005005 | C-CER,CHIP;100nF,10%,16V,X7R,1608 | 1 | S.A | |
| ....4 | C120 | 2203-005005 | C-CER,CHIP;100nF,10%,16V,X7R,1608 | 1 | S.A | |
| ....4 | C120 | 2203-005005 | C-CER,CHIP;100nF,10%,16V,X7R,1608 | 1 | S.A | |
| ....4 | C120 | 2203-005005 | C-CER,CHIP;100nF,10%,16V,X7R,1608 | 1 | S.A | |
| ....4 | C120 | 2203-005005 | C-CER,CHIP;100nF,10%,16V,X7R,1608 | 1 | S.A | |
| ....4 | C120 | 2203-005005 | C-CER,CHIP;100nF,10%,16V,X7R,1608 | 1 | S.A | |
| ....4 | C120 | 2203-005005 | C-CER,CHIP;100nF,10%,16V,X7R,1608 | 1 | S.A | |
| ....4 | C120 | 2203-005005 | C-CER,CHIP;100nF,10%,16V,X7R,1608 | 1 | S.A | |
| ....4 | C120 | 2203-005005 | C-CER,CHIP;100nF,10%,16V,X7R,1608 | 1 | S.A | |
| ....4 | C120 | 2203-005005 | C-CER,CHIP;100nF,10%,16V,X7R,1608 | 1 | S.A | |
| ....4 | C120 | 2203-005005 | C-CER,CHIP;100nF,10%,16V,X7R,1608 | 1 | S.A | |
| ....4 | C120 | 2203-005005 | C-CER,CHIP;100nF,10%,16V,X7R,1608 | 1 | S.A | |
| ....4 | C120 | 2203-005005 | C-CER,CHIP;100nF,10%,16V,X7R,1608 | 1 | S.A | |
| ....4 | C120 | 2203-005005 | C-CER,CHIP;100nF,10%,16V,X7R,1608 | 1 | S.A | |
| ....4 | C120 | 2203-005005 | C-CER,CHIP;100nF,10%,16V,X7R,1608 | 1 | S.A | |
| ....4 | C120 | 2203-005005 | C-CER,CHIP;100nF,10%,16V,X7R,1608 | 1 | S.A | |
| ....4 | C120 | 2203-005005 | C-CER,CHIP;100nF,10%,16V,X7R,1608 | 1 | S.A | |
| ....4 | C120 | 2203-005005 | C-CER,CHIP;100nF,10%,16V,X7R,1608 | 1 | S.A | |
| ....4 | C120 | 2203-005005 | C-CER,CHIP;100nF,10%,16V,X7R,1608 | 1 | S.A | |
| ....4 | C120 | 2203-005005 | C-CER,CHIP;100nF,10%,16V,X7R,1608 | 1 | S.A | |
| ....4 | C120 | 2203-005005 | C-CER,CHIP;100nF,10%,16V,X7R,1608 | 1 | S.A | |

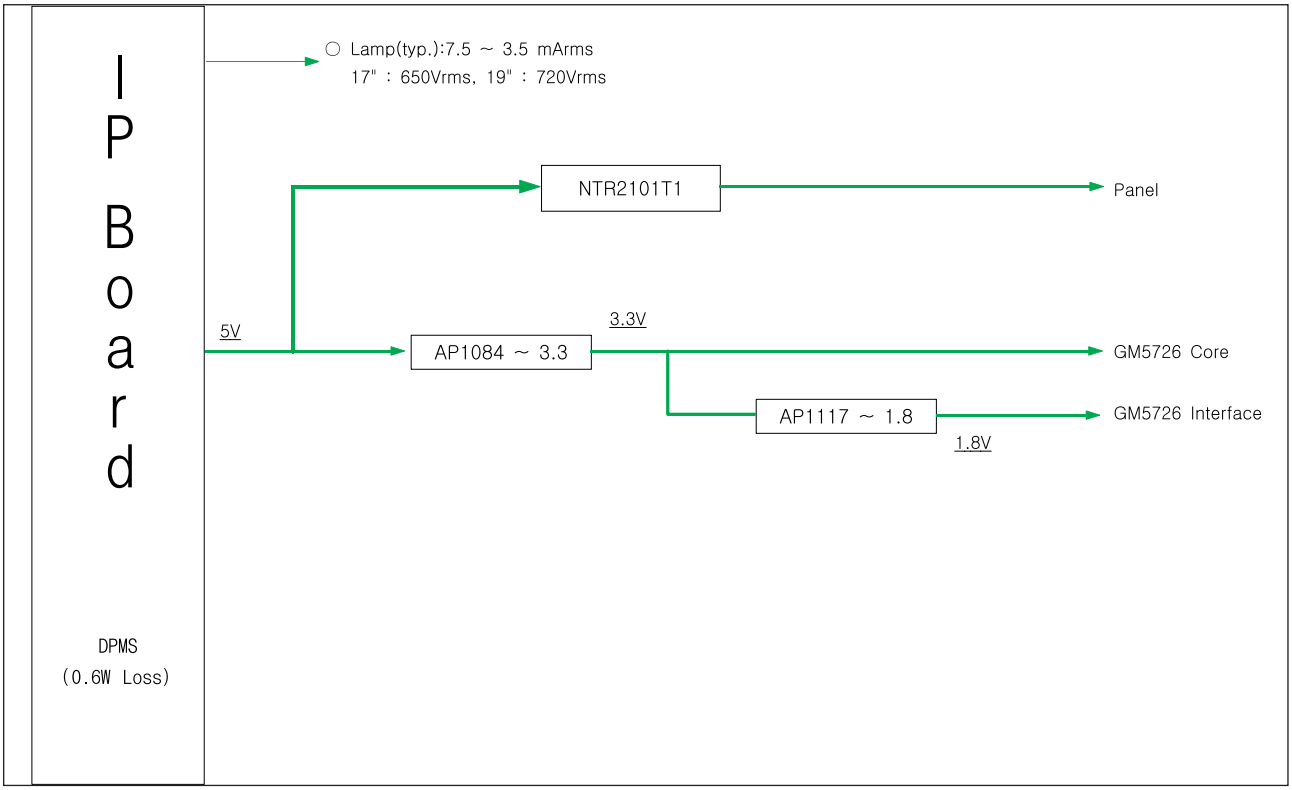
| Level | Loc. No. | Code No. | Description & Specification | Q'ty | SA/SNA | Remark |
|---|---|---|---|---|---|---|
| ....4 | C120 | 2203-005005 | C-CER,CHIP;100nF,10%,16V,X7R,1608 | 1 | S.A | |
| ....4 | C120 | 2203-005005 | C-CER,CHIP;100nF,10%,16V,X7R,1608 | 1 | S.A | |
| ....4 | C120 | 2203-005005 | C-CER,CHIP;100nF,10%,16V,X7R,1608 | 1 | S.A | |
| ....4 | C120 | 2203-005005 | C-CER,CHIP;100nF,10%,16V,X7R,1608 | 1 | S.A | |
| ....4 | C120 | 2203-005005 | C-CER,CHIP;100nF,10%,16V,X7R,1608 | 1 | S.A | |
| ....4 | C120 | 2203-005005 | C-CER,CHIP;100nF,10%,16V,X7R,1608 | 1 | S.A | |
| ....4 | C120 | 2203-005005 | C-CER,CHIP;100nF,10%,16V,X7R,1608 | 1 | S.A | |
| ....4 | C120 | 2203-005005 | C-CER,CHIP;100nF,10%,16V,X7R,1608 | 1 | S.A | |
| ....4 | C120 | 2203-005005 | C-CER,CHIP;100nF,10%,16V,X7R,1608 | 1 | S.A | |
| ....4 | C120 | 2203-005005 | C-CER,CHIP;100nF,10%,16V,X7R,1608 | 1 | S.A | |
| ....4 | C120 | 2203-005005 | C-CER,CHIP;100nF,10%,16V,X7R,1608 | 1 | S.A | |
| ....4 | C120 | 2203-005005 | C-CER,CHIP;100nF,10%,16V,X7R,1608 | 1 | S.A | |
| ....4 | C120 | 2203-005005 | C-CER,CHIP;100nF,10%,16V,X7R,1608 | 1 | S.A | |
| ....4 | C120 | 2203-005005 | C-CER,CHIP;100nF,10%,16V,X7R,1608 | 1 | S.A | |
| ....4 | C120 | 2203-005005 | C-CER,CHIP;100nF,10%,16V,X7R,1608 | 1 | S.A | |
| ....4 | C120 | 2203-005005 | C-CER,CHIP;100nF,10%,16V,X7R,1608 | 1 | S.A | |
| ....4 | C120 | 2203-005005 | C-CER,CHIP;100nF,10%,16V,X7R,1608 | 1 | S.A | |
| ....4 | C120 | 2203-005005 | C-CER,CHIP;100nF,10%,16V,X7R,1608 | 1 | S.A | |
| ....4 | C120 | 2203-005005 | C-CER,CHIP;100nF,10%,16V,X7R,1608 | 1 | S.A | |
| ....4 | C120 | 2203-005005 | C-CER,CHIP;100nF,10%,16V,X7R,1608 | 1 | S.A | |
| ....4 | C120 | 2203-005005 | C-CER,CHIP;100nF,10%,16V,X7R,1608 | 1 | S.A | |
| ....4 | C120 | 2203-005005 | C-CER,CHIP;100nF,10%,16V,X7R,1608 | 1 | S.A | |
| ....4 | C120 | 2203-005005 | C-CER,CHIP;100nF,10%,16V,X7R,1608 | 1 | S.A | |
| ....4 | C120 | 2203-005005 | C-CER,CHIP;100nF,10%,16V,X7R,1608 | 1 | S.A | |
| ....4 | C120 | 2203-005065 | C-CER,CHIP;1000nF,+80-20%,10V,Y5V,1608 | 1 | S.A | |
| ....4 | C120 | 2203-005065 | C-CER,CHIP;1000nF,+80-20%,10V,Y5V,1608 | 1 | S.A | |
| ....4 | C120 | 2203-005065 | C-CER,CHIP;1000nF,+80-20%,10V,Y5V,1608 | 1 | S.A | |
| ....4 | C120 | 2203-005065 | C-CER,CHIP;1000nF,+80-20%,10V,Y5V,1608 | 1 | S.A | |
| ....4 | C120 | 2203-005065 | C-CER,CHIP;1000nF,+80-20%,10V,Y5V,1608 | 1 | S.A | |
| ....4 | C120 | 2203-005437 | C-CER,CHIP;10000nF,+80-20%,10V,Y5V,3216 | 1 | S.A | |
| ....4 | C120 | 2203-005437 | C-CER,CHIP;10000nF,+80-20%,10V,Y5V,3216 | 1 | S.A | |
| ....4 | C120 | 2203-005437 | C-CER,CHIP;10000nF,+80-20%,10V,Y5V,3216 | 1 | S.A | |
| ....4 | C120 | 2203-005437 | C-CER,CHIP;10000nF,+80-20%,10V,Y5V,3216 | 1 | S.A | |
| ....4 | C306 | 2402-001128 | C-AL,SMD;100¥iF,20%,16V,-,TP,6.3X5.7mm | 1 | S.A | |
| ....4 | C608 | 2402-001128 | C-AL,SMD;100¥iF,20%,16V,-,TP,6.3X5.7mm | 1 | S.A | |
| ....4 | C609 | 2402-001128 | C-AL,SMD;100¥iF,20%,16V,-,TP,6.3X5.7mm | 1 | S.A | |
| ....4 | C644 | 2402-001128 | C-AL,SMD;100¥iF,20%,16V,-,TP,6.3X5.7mm | 1 | S.A | |
| ....4 | X300 | 2801-003667 | CRYSTAL-SMD;14.31818MHz,30ppm,28-AAN,16p | 1 | S.A | |
| ....4 | T0568 | 3301-001145 | BEAD-SMD;60ohm,4516,TP,70ohm/45MHz,82ohm | 1 | S.N.A | |
| ....4 | T0568 | 3301-001145 | BEAD-SMD;60ohm,4516,TP,70ohm/45MHz,82ohm | 1 | S.N.A | |
| ....4 | T0568 | 3301-001145 | BEAD-SMD;60ohm,4516,TP,70ohm/45MHz,82ohm | 1 | S.N.A | |
| ....4 | T0568 | 3301-001145 | BEAD-SMD;60ohm,4516,TP,70ohm/45MHz,82ohm | 1 | S.N.A | |
| ....4 | T0568 | 3301-001145 | BEAD-SMD;60ohm,4516,TP,70ohm/45MHz,82ohm | 1 | S.N.A | |
| ....4 | T0568 | 3301-001145 | BEAD-SMD;60ohm,4516,TP,70ohm/45MHz,82ohm | 1 | S.N.A | |
| ....4 | T0568 | 3301-001145 | BEAD-SMD;60ohm,4516,TP,70ohm/45MHz,82ohm | 1 | S.N.A | |
| ....4 | T0568 | 3301-001145 | BEAD-SMD;60ohm,4516,TP,70ohm/45MHz,82ohm | 1 | S.N.A | |
| ....4 | T0568 | 3301-001145 | BEAD-SMD;60ohm,4516,TP,70ohm/45MHz,82ohm | 1 | S.N.A | |
| ....4 | CN400 | 3708-001150 | CONNECTOR-FPC/FFC/PIC;30P,1mm,SMD-A,SN,Y | 1 | S.A | |
| ....4 | CN330 | 3711-005503 | HEADER-BOARD TO CABLE;BOX,9P,1R,2mm,SMD- | 1 | S.A | |
| ....4 | CN330 | 3711-005509 | HEADER-BOARD TO CABLE;BOX,4P,1R,1.25mm,S | 1 | S.A | |
| ....4 | T0077 | BN41-00792A | PCB MAIN;LS19PEB,Silver through,2,MP1.0, | 1 | S.N.A | |
| ....4 | M0018 | BN97-01894C | ASSY MICOM;Pebble,LPE19EB,english,MX25L1 | 1 | S.N.A | |
| .....5 | IC115 | 1107-001614 | IC-FLASH MEMORY;MX25L1005,1Mbit,1Mx1Bit, | 1 | S.N.A | |
| ..2 | M0006 | BN96-04145A | ASSY SHIELD P-COVER;PEBBLE19,SECC,T0.8 | 1 | S.N.A | |
| ...3 | | BN61-02429D | STUD-PEM;PNB,M2.8,D7,L20,ZPC(SIL),SUM24L | 1 | S.N.A | |
| ...3 | M0107 | BN63-02886A | SHIELD-COVER;PEBBLE,SECC,0.8,19INCH | 1 | S.N.A | |
| ...3 | M0114 | BP61-01088A | HOLDER-WIRE;SVP-42L6,NYLON | 1 | S.N.A | |
| ...3 | M0131 | AA63-01240A | GASKET;FIRENZE,Conductive Fabric,3mm,12m | 2 | S.N.A | |

| Level | Loc. No. | Code No. | Description & Specification | Q'ty | SA/SNA | Remark |
|---|---|---|---|---|---|---|
| ..2 | M0524 | BP39-00028A | CONNECT WIRE;BI17,19BS,UL1007#26,9P,80mm | 1 | S.A | |
| ..2 | M0251 | BN96-02854R | ASSY CABLE P;Pebble,FLAT CABLE,-,120mm,3 | 1 | S.A | |
| 0.1 | M0019 | BN92-02024Q | ASSY LABEL;LS17PEASB/EDC | 1 | S.N.A | |
| 0.1 | M0113 | BN92-02029B | ASSY P/MATERIAL;LS19PEB*,SAA4,PEBBLE | 1 | S.N.A | |
| ..2 | T0524 | 6902-000241 | BAG PE;NITRON/HDPE,T0.5/T0.012,W600,L600 | 1 | S.N.A | |
| ..2 | T0376 | 6902-000379 | BAG AIR;LDPE,T0.2,W1000,L1800,TRP,-,-- | 0.001 | S.N.A | |
| ..2 | T0003 | 6902-000604 | BAG WRAPPING;LDPE,T0.02,W500,L10000,TRP, | 0.85 | S.N.A | |
| ..2 | M0081 | 6902-000609 | BAG ROLL;LDPE,T0.05,W2400,L1000,TRP,-,- | 0.018 | S.N.A | |
| 0.1 | M0003 | BN92-02030B | ASSY BOX;LS19PEBSW/EDC,SAA4 | 1 | S.N.A | |
| ..2 | BOX | BN69-01527A | BOX-04,MONITOR;LS19PB,SY-01,A,A1,W476,D4 | 1.02 | S.N.A | |
| ..2 | T0081 | BN96-02895A | ASSY MISC P-HANDLE PACKING;ALL MODEL,BN6 | 1 | S.N.A | |
| ...3 | M0102 | BN66-00008A | LEVER-BOTTOM;ALL MODEL,LDPE,WHITE | 1 | S.N.A | |
| ...3 | M0103 | BN66-00007A | LEVER-TOP;ALL MODEL,LDPE,WHITE | 1 | S.N.A | |
| 0.1 | M0045 | BN92-02221F | ASSY ACCESSORY;LS19PEBSBV/EDC | 1 | S.N.A | |
| ..2 | M0114 | BN39-00244B | CBF SIGNAL;MO15PS,15P/15P,20276-N,1830mm | 1 | S.A | |
| ..2 | M0125 | BN39-00246F | CBF SIGNAL-DVI(D);1703FP,24P/24P,20276-D | 1 | S.A | |
| ..2 | | BN68-01115C | MANUAL FLYER-QSG;COMM,SyncMaster,korean, | 1 | S.N.A | |
| ..2 | M0013 | BN96-04150D | ASSY STAND P-BAR;-,PEBBLE17,-,ABS HB,BK2 | 1 | S.A | |
| ...3 | M0081 | 6003-000282 | SCREW-TAPTITE;BH,+,-,B,M3,L8,ZPC(BLK),SW | 2 | S.A | |
| ...3 | T0524 | 6902-000023 | BAG PE;LDPE,T0.08,L120,W150,TRP,,,PE MAR | 1 | S.N.A | |
| ...3 | | BN61-02783D | STAND-BAR;PEBBLE,ABS HB,SL-414WH,BK26,SF | 1 | S.N.A | |
| ...3 | | BN61-02786A | BRACKET-PLATE;PEBBLE,SECC,1.0 | 1 | S.N.A | |
| ..2 | M0027 | BN96-04154B | ASSY STAND P-BASE;-,PEBBLE19,-,ABS HB,BK | 1 | S.A | |
| ...3 | M0081 | 6003-000282 | SCREW-TAPTITE;BH,+,-,B,M3,L8,ZPC(BLK),SW | 4 | S.A | |
| ...3 | T0524 | 6902-000389 | BAG PE;HDPE/NITRON/HDPE,T0.015/T0.5/T0.0 | 1 | S.N.A | |
| ...3 | CIS4 | BN61-01717A | HOLDER-STAND;BIZET,NI PLT,CH,+,M4,L11(5) | 1 | S.A | |
| ...3 | | BN61-02785A | BRACKET-STAND BODY;PEBBLE,SECC,0.8 | 1 | S.N.A | |
| ...3 | CCM1 | BN63-02183C | COVER-SHEET;Rhcm,PE Vinyl,T0.05,200mm,20 | 0.3 | S.N.A | |
| ...3 | T0004 | BN63-02882B | COVER-STAND BASE;PEBBLE,ABS,2.6,HB,BK26 | 1 | S.N.A | |
| ...3 | T0132 | BN73-00077A | RUBBER FOOT;MATISSE,BUMPON,¨a13.5,T2.0,6 | 4 | S.N.A | |
| ...3 | | BN68-01115A | MANUAL FLYER-QSG;COMM,SyncMaster,korean, | 1 | S.N.A | |
| ..2 | M0045 | BN96-04279T | ASSY ACCESSORY;LS17PEASB/EDC,-,-,-,-,- | 1 | S.A | |
| ...3 | T0268 | 3903-000042 | CBF-POWER CORD;DT,EU,FP3/YES,IEC320 C13/ | 1 | S.A | |
| ...3 | T0524 | 6902-000110 | BAG PE;LDPE,T0.05,W250,L400,TRP,28,2 | 1 | S.N.A | |
| ...3 | ACCESSORY | BH68-70448A | CARD-01;TFT LCD,SRC,RUSSIA,S/W,120,W210* | 1 | S.N.A | |
| ...3 | ACCESSORY | BN63-02368A | CLOTH;LS07BTT,SUEDE,0.6,160,120 | 1 | S.N.A | |
| ...3 | ACCESSORY | BN68-00907A | MANUAL FLYER-01,CARD;COMM,SAMSUNG,18 LAN | 1 | S.N.A | |
| ...3 | M0215 | BN96-04304A | ASSY MANUAL P-IB+QSG;932B,732N,-,SyncMas | 1 | S.N.A | |
| ....4 | QSG | BH68-00376L | MANUAL FLYER-06,QSG;LCDQUICK SETUP GUIDE | 1 | S.N.A | |
| ....4 | IB | BN59-00585A | S/W DRIVER-03,IB;932B,732N,W/W,SyncMaste | 1 | S.N.A | |
| ...3 | ACCESSORY | BN68-01237A | MANUAL FLYER-QSG;COMM,W/W(L12),Mojo 100g | 1 | S.N.A | |
| ...3 | ACCESSORY | BH68-00633B | MANUAL FLYER-00,WARRANTY CARD;comm,Samsu | 1 | S.N.A | |
| ...3 | ACCESSORY | BN68-01118A | MANUAL-01,TCO99 CARD;COMM,W/W,Mojo 100g, | 1 | S.N.A | |

# 13 Circuit Descriptions

## 13-1 Overall Block Structure

### 13-1-1 Power Tree

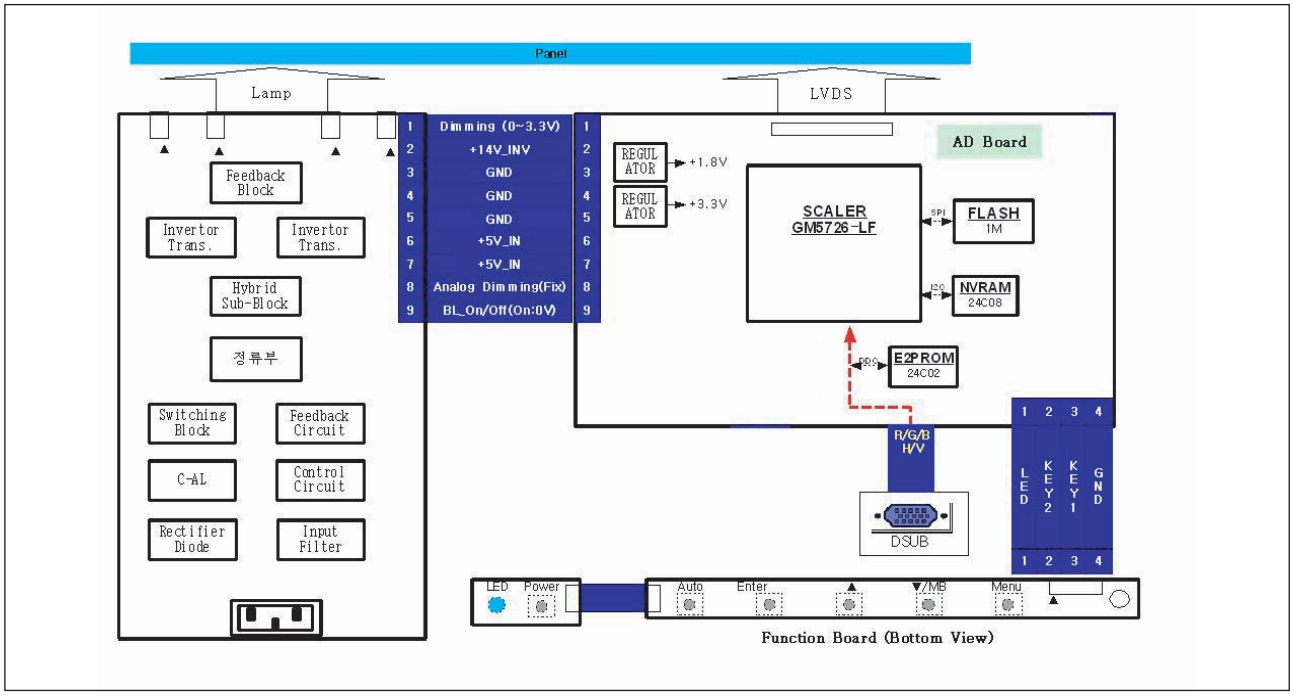



1. When the AD board is in DPMS state:
   1.1 The IP has been designed so that it operates with a power consumption of less than 0.6W of.
   1.2 The Scaler consumes power up to 37mA
   1.3 The power to the panel is switched off

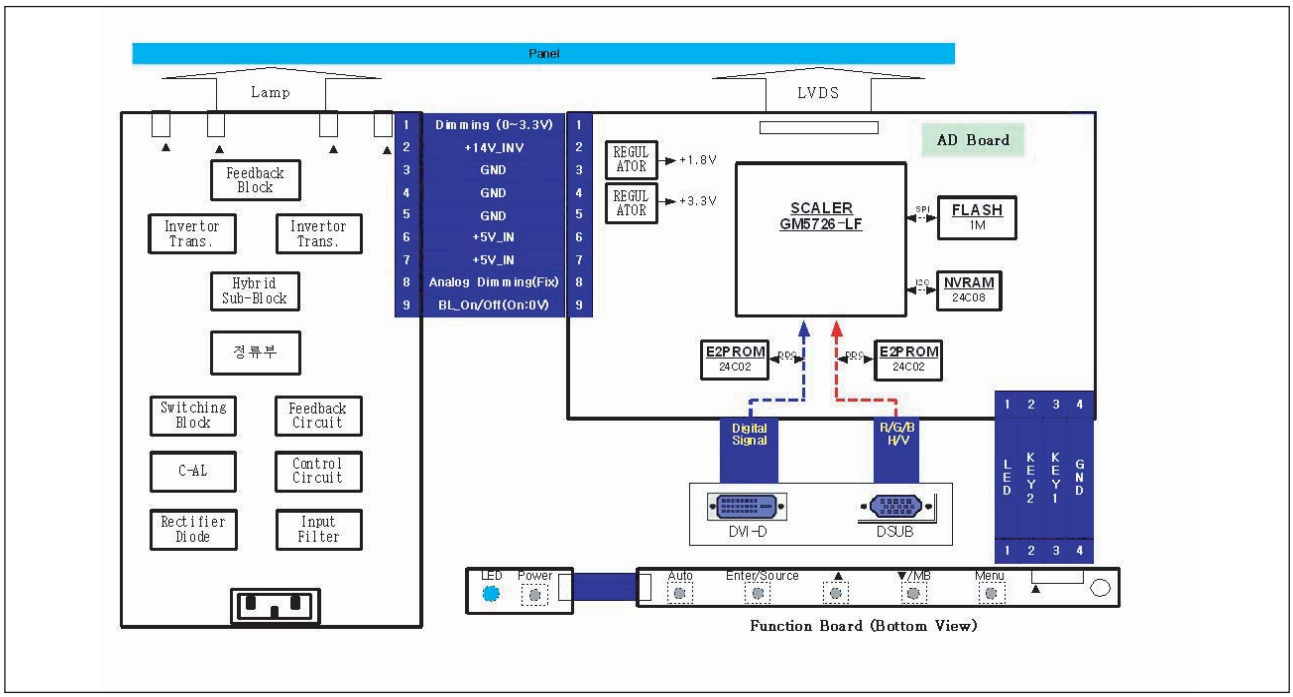
2. When the AD board is operating normally:
   2.1 The maximum power consumption of the panel lamps is described below (It may vary depending on the panel manufacturer)
   17" : 4*(7.5mA*650mVrms)=4*4.9=19.6W
   19: : 4*(7.5mA*720mVrms)=4*5.4=21.6W
   2.2 The power consumption of the Panel Control board is as follows: 5V*720mA=3.6W
   2.3 The power consumption of the Scaler is as follows: 3.3V*245mA + 1.8V*300mA = 1.35W

# 13-1-2 Main Board Parts

## LS17PEA, LS19PEA




## LS19PEB



1. Inverter: A conversion device that converts DC rated voltage/current to high ones necessary for the panel lamp.

2. DC/DC(Regulator): General term for DC to DC converting devices.
   The IP board receives 5V and outputs 1.8 or 3.3V that is supplied to the scaler (GM5726).

3. Power MosFET: The IP board receives 5V and outputs a lower voltage in DPMS mode and supplies the whole 5V for the panel operating board in normal conditions. In that case, the switching of Power MosFET is controlled by Micom.

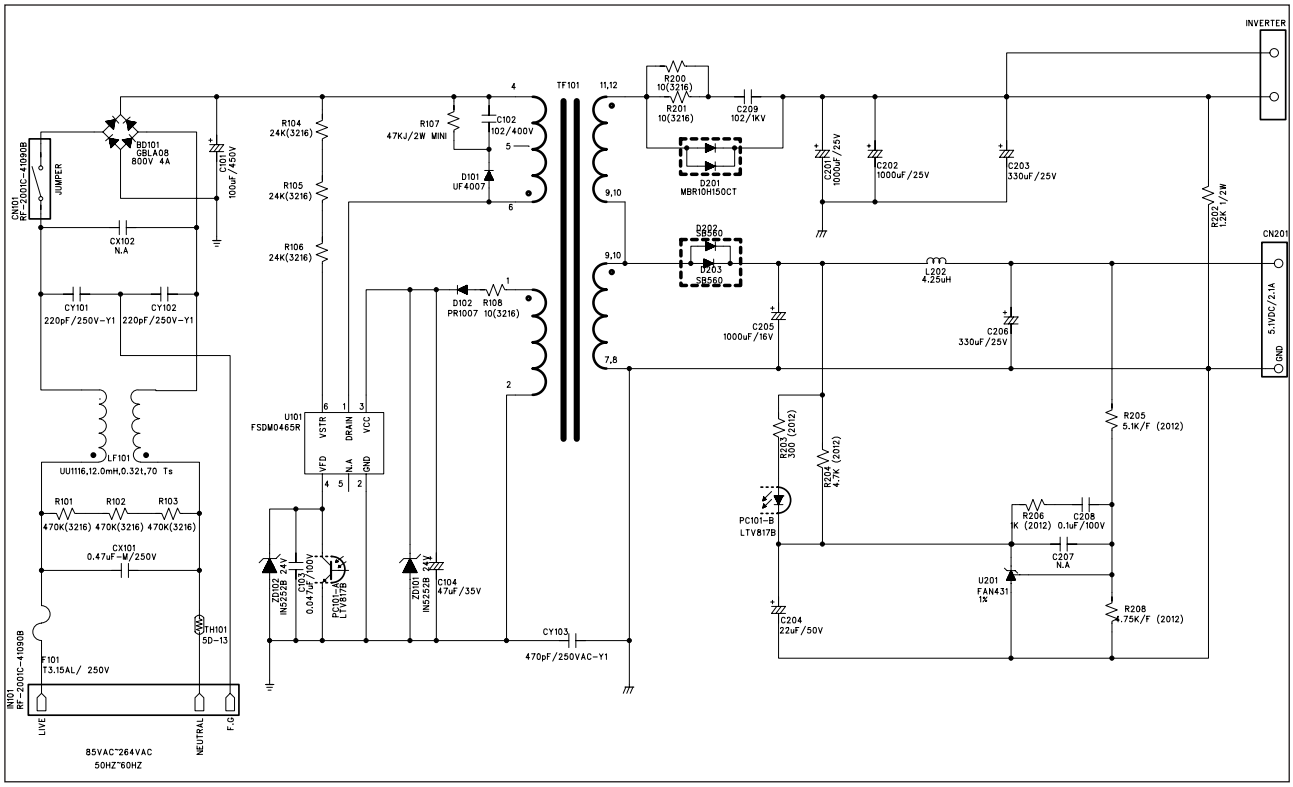
4. Scaler: Receives the digital TMDS and analog R,G,B signals and convert them to proper resolutions using up- or down- scaling that are transferred to the panel in the LDVS formats.

5. Crystal(Oscillator): Use one 14.318MHz oscillator externally to supply power to both MCU and Scaler at the same time.

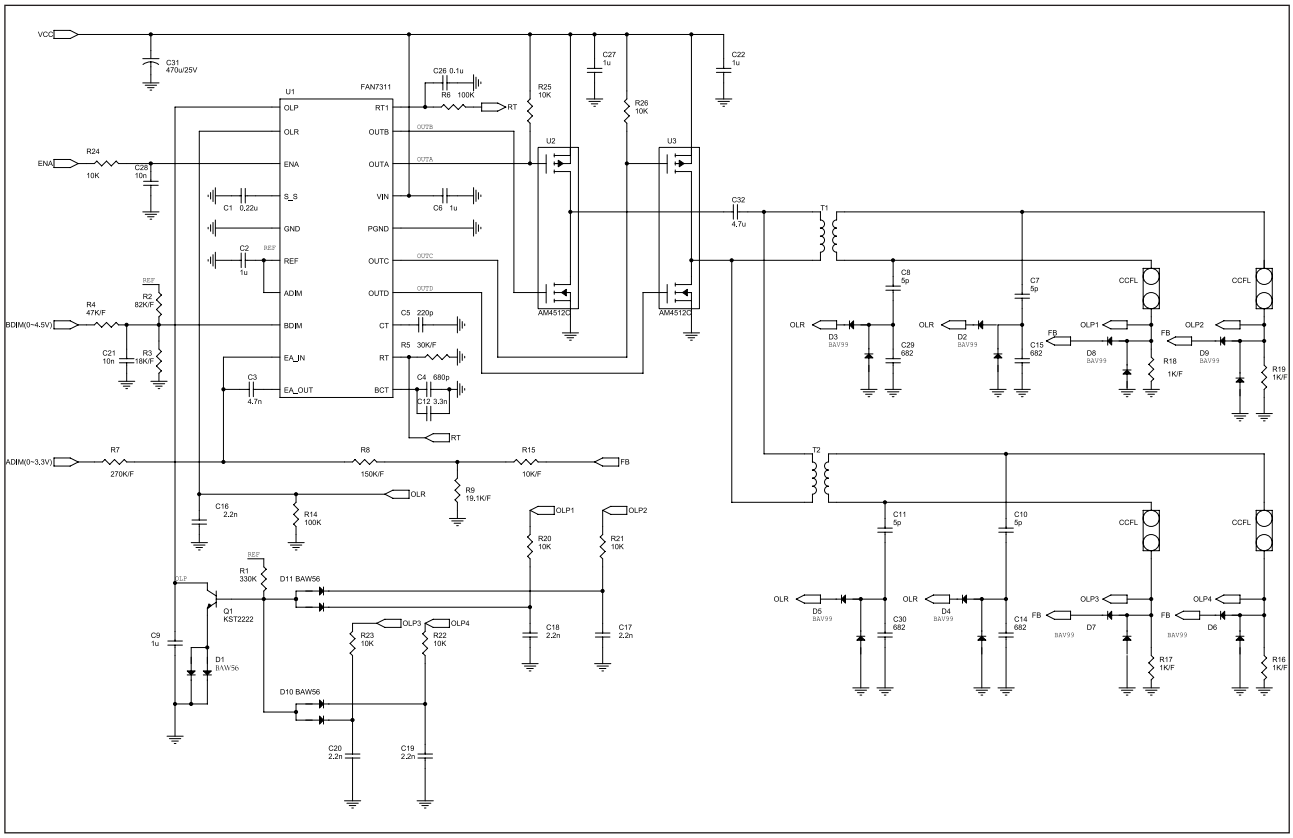
6. SCALER & EEPROM: I2C is a two-way serial bus of two lines that supports communications across the integrated circuits as well as between FLASH and EEPROM.
   In particular, FLASH and Scaler (GM5726) use the SDR direct bus for mutual communications, which is an effective, speedy system because it allows 4 additional address/data lines compared to the old serial systems.

7. Function Key: A certain keystroke generates a certain electrical potential, which is transferred into ADC input port of the Scaler and then converted to a digital value by the A/D converter of the chip. The digital value (data) is a clue to which key is entered. In practical, the voltage levels are set as below.

## 13-1-3 IP BOARD BLOCK(POWER) Parts




## 13-1-4 IP BOARD BLOCK( INVERTER ) Parts



## 13-1-5 IP BOARD ( inverter ) PROTECTION Parts

Pebble INVERTER CONTROLER FAN7310 have 2-way of the PROTECTION MODE.

**1. OVP[Over Voltage Protection]** : If the Voltage of the series capacitors C10 & C15 is over the 2.0V, the Inverter latched-off.[See the Picture1]

**2. OLP[Over Load Protection]** : If the inverter output harness is opened(No-output current), the base of the Q1 turns on and chage the C9 ovter 2V and then, the Inverter latched-off[See the Picture2]

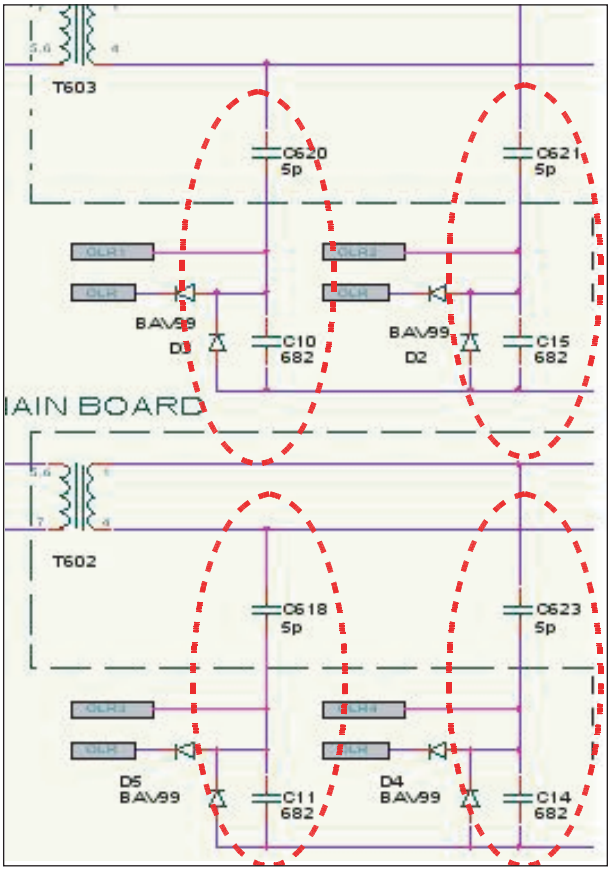



Figure 1.

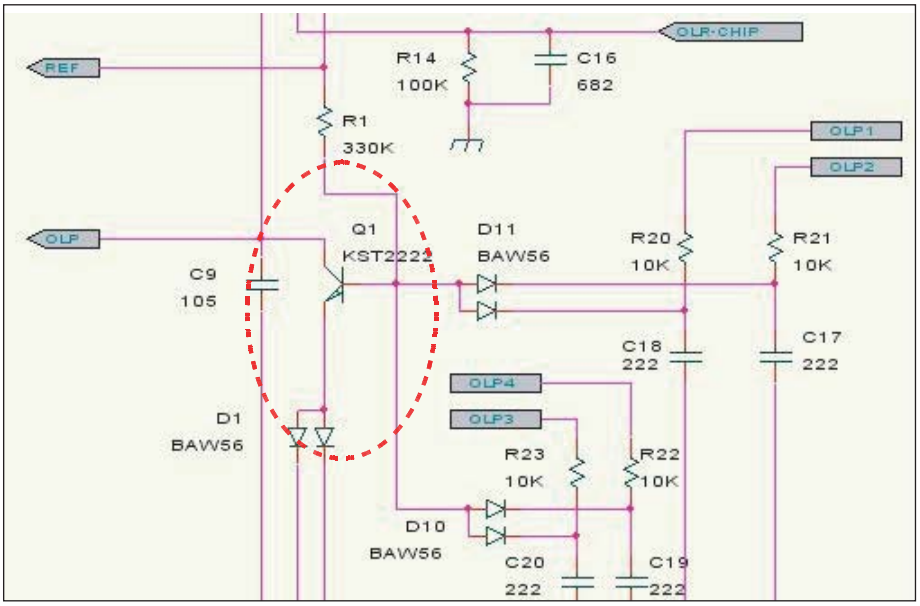
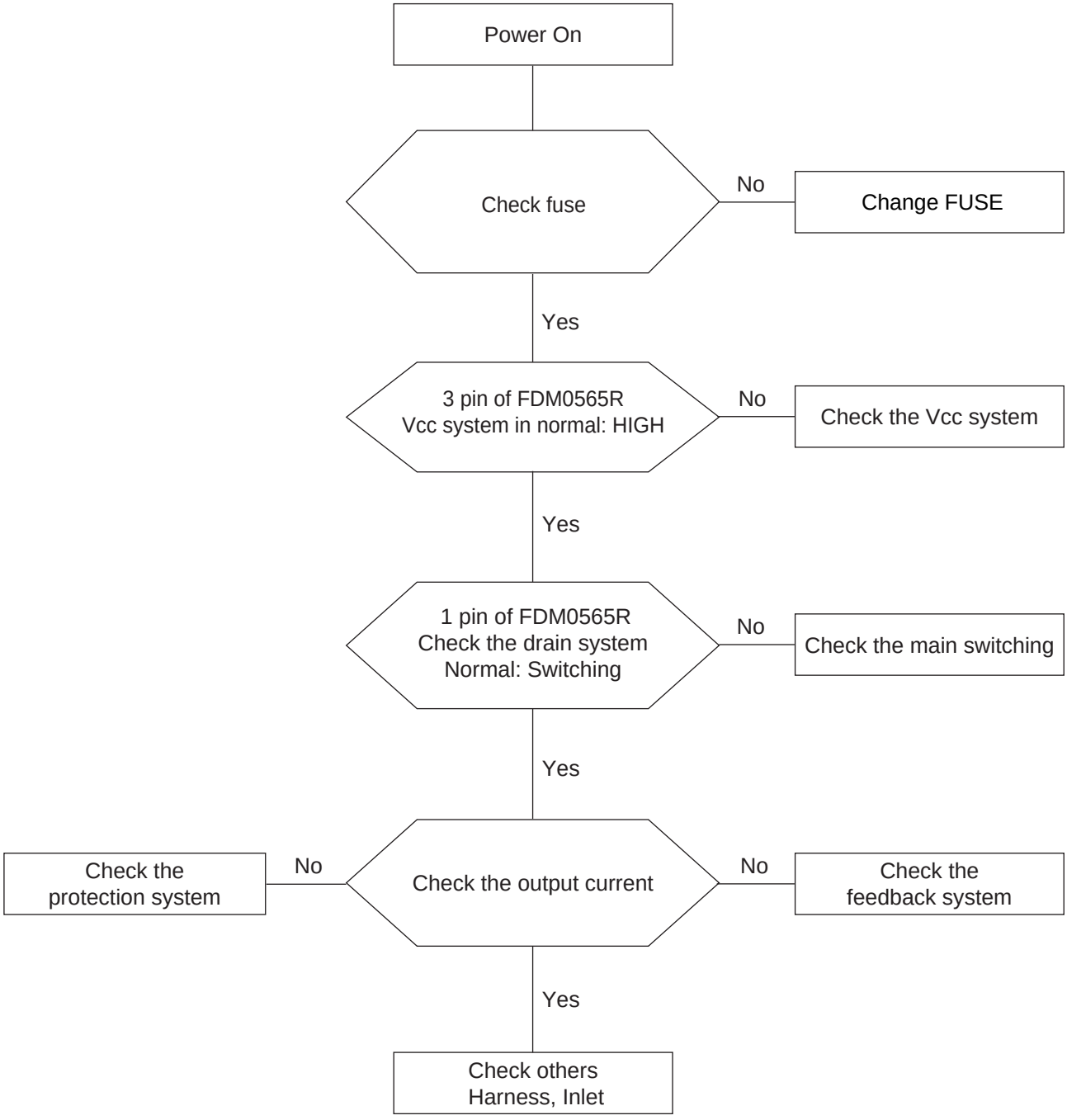


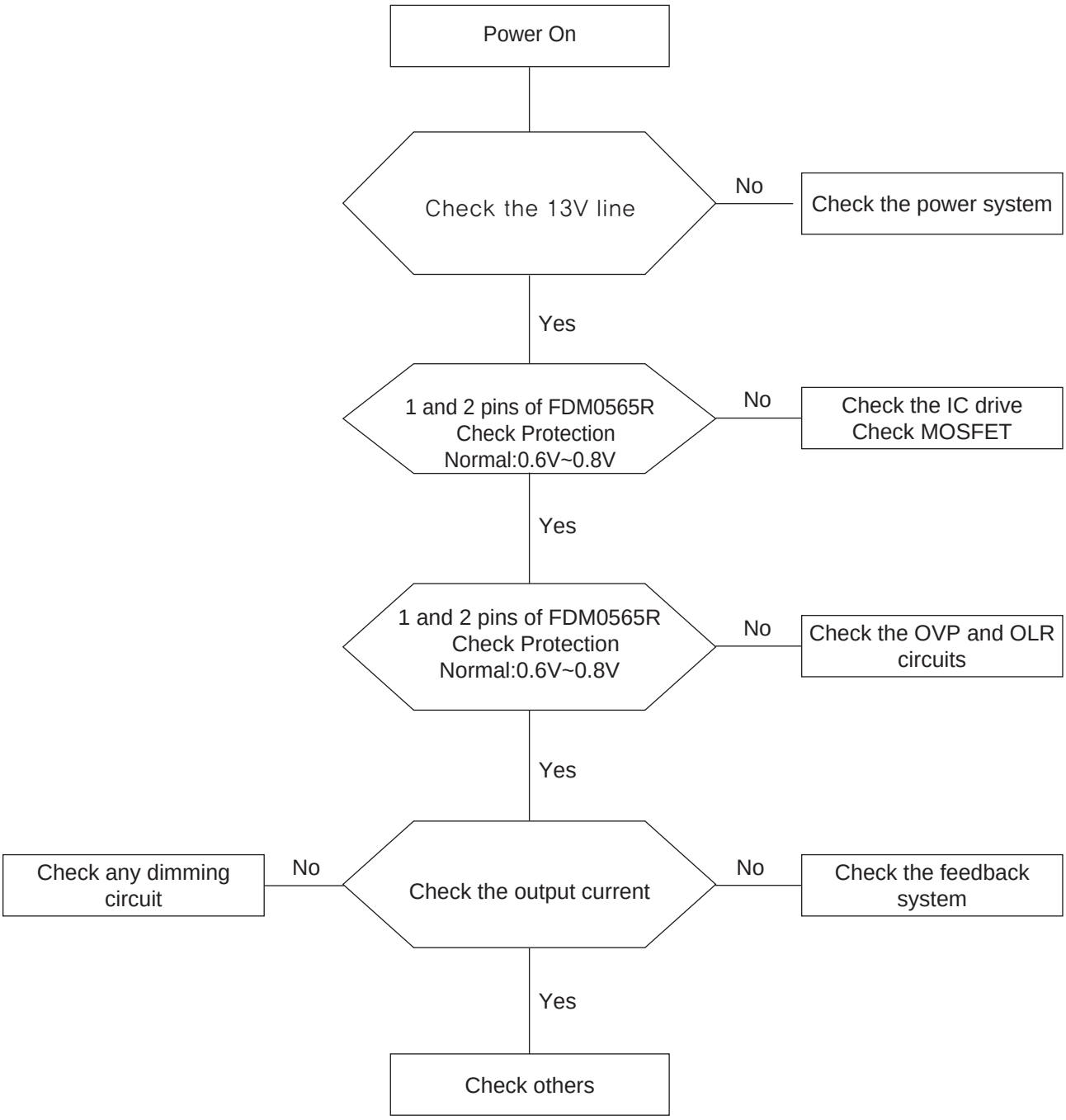

Figure 2.

# 13-2 Trouble Shooting

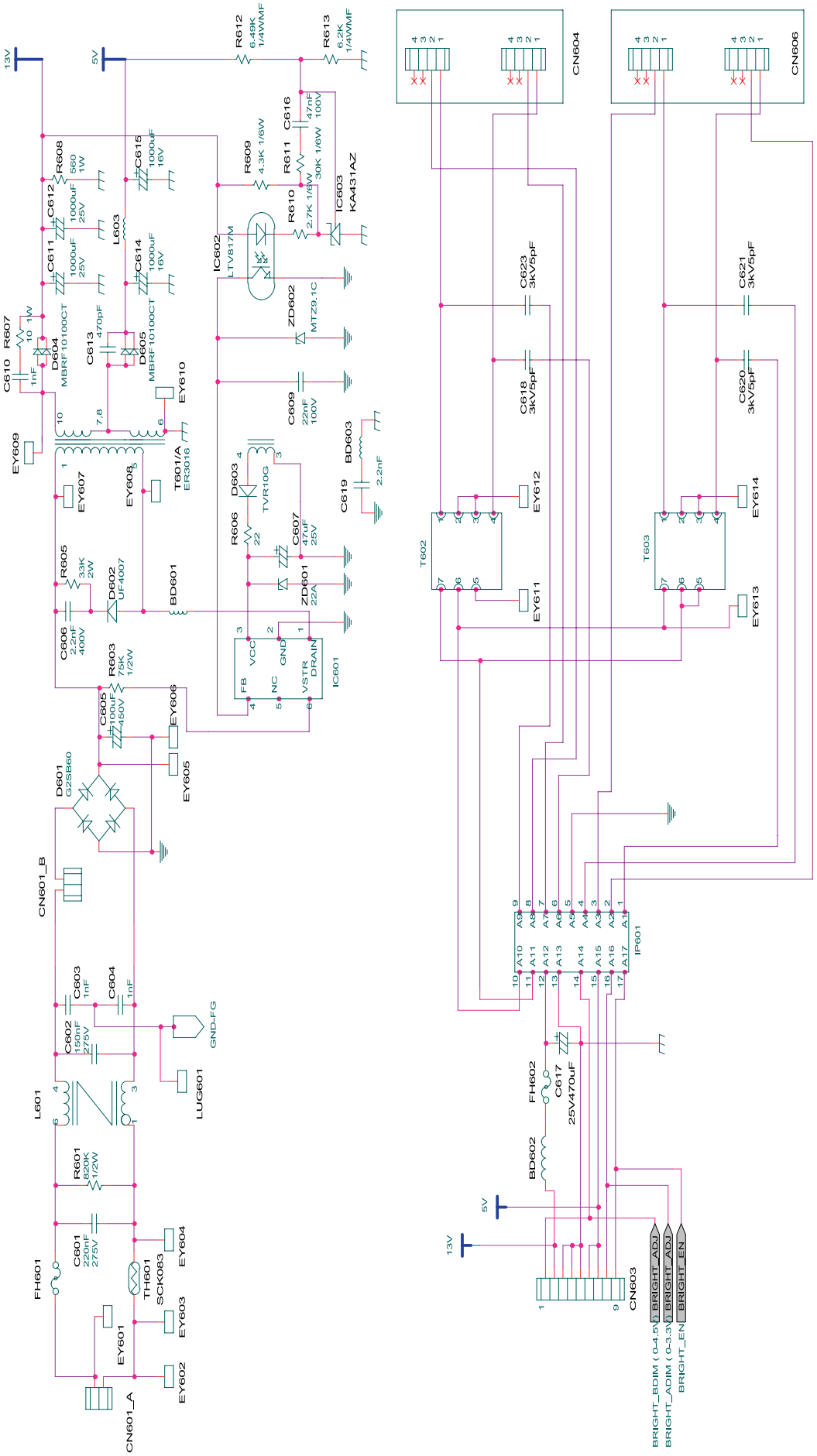
## 13-2-1 IP BOARD(Power)



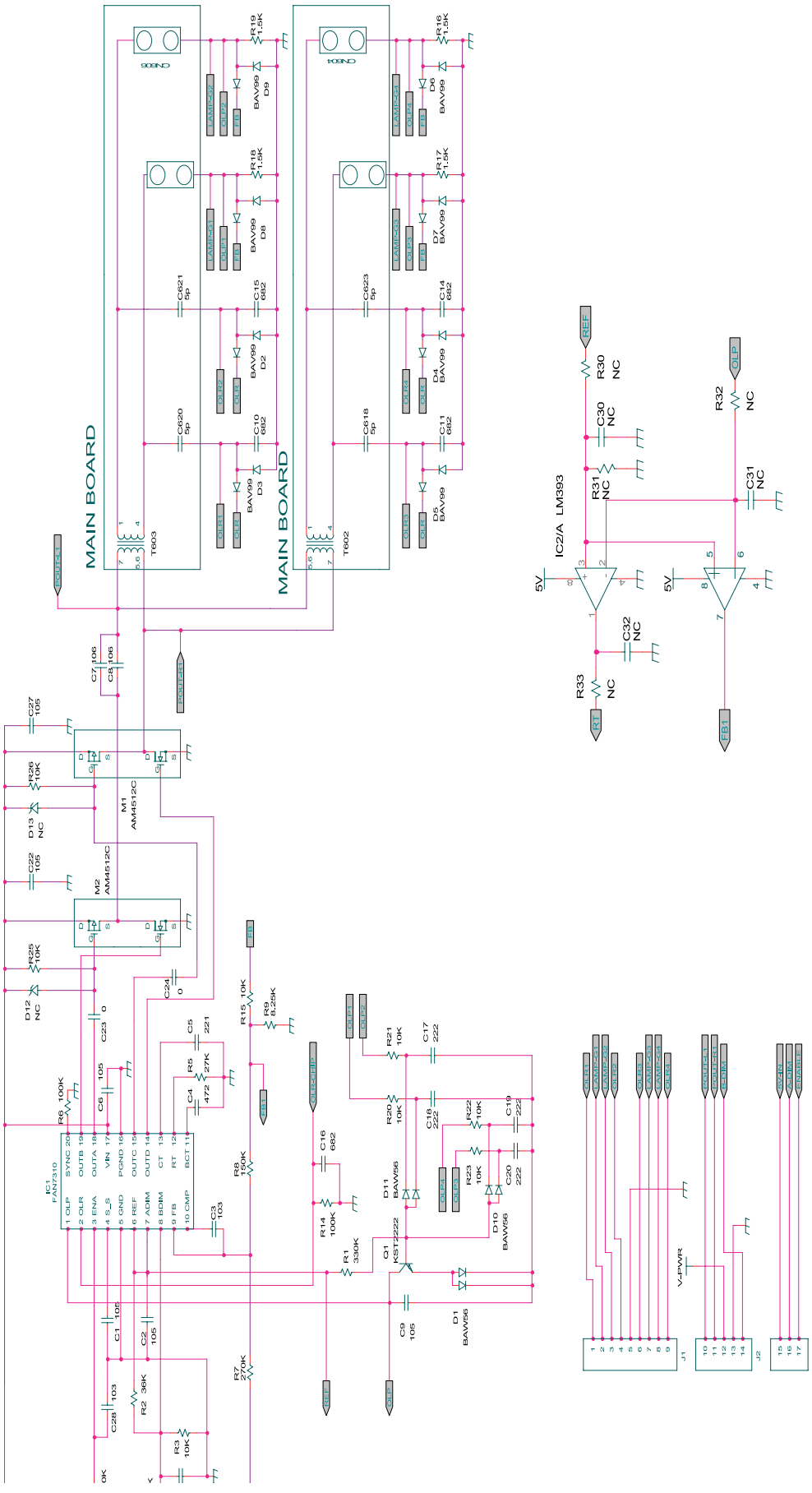
## 13-2-1 IP BOARD(Inverter)



# 13-3 IP BOARD(Power) Schematic Diagrams



# 13-4 IP BOARD(Inverter) Schematic Diagrams



Memo

# 1 Precautions

Follow these safety, servicing and ESD precautions to prevent damage and to protect against potential hazards such as electrical shock.

## 1-1 Safety Precautions

### 1-1-1 Warnings

1. For continued safety, do not attempt to modify the circuit board.
2. Disconnect the AC power and DC power jack before servicing.

### 1-1-2 Servicing the LCD Monitor

1. When servicing the LCD Monitor, Disconnect the AC line cord from the AC outlet.
2. It is essential that service technicians have an accurate voltage meter available at all times. Check the calibration of this meter periodically.

### 1-1-3 Fire and Shock Hazard

Before returning the monitor to the user, perform the following safety checks:

1. Inspect each lead dress to make certain that the leads are not pinched or that hardware is not lodged between the chassis and other metal parts in the monitor.
2. Inspect all protective devices such as nonmetallic control knobs, insulating materials, cabinet backs, adjustment and compartment covers or shields, isolation resistor-capacitor networks, mechanical insulators, etc.
3. Leakage Current Hot Check (Figure 1-1):

   **WARNING** : Do not use an isolation transformer during this test.

   Use a leakage current tester or a metering system that complies with American National Standards Institute (*ANSI C101.1, Leakage Current for Appliances*), and Underwriters Laboratories (*UL Publication UL1410, 59.7*).

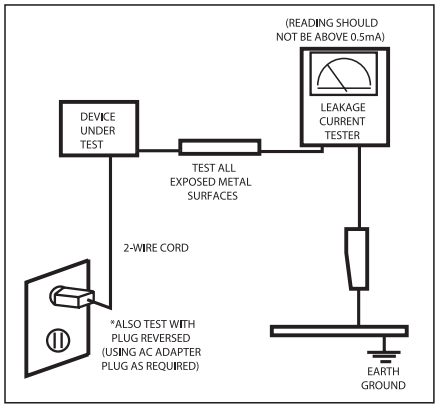



Figure 1-1. Leakage Current Test Circuit

4. With the unit completely reassembled, plug the AC line cord directly into a 120V AC outlet. With the unit's AC switch first in the ON position and then OFF, measure the current between a known earth ground (metal water pipe, conduit, etc.) and all exposed metal parts, including: metal cabinets, screwheads and control shafts. The current measured should not exceed 0.5 milliamp. Reverse the power-plug prongs in the AC outlet and repeat the test.

### 1-1-4 Product Safety Notices

Some electrical and mechanical parts have special safety-related characteristics which are often not evident from visual inspection. The protection they give may not be obtained by replacing them with components rated for higher voltage, wattage, etc. Parts that have special safety characteristics are identified by ⚠ on schematics and parts lists. A substitute replacement that does not have the same safety characteristics as the recommended replacement part might create shock, fire and/or other hazards. Product safety is under review continuously and new instructions are issued whenever appropriate.

# 1-2 Servicing Precautions

**WARNING:** An electrolytic capacitor installed with the wrong polarity might explode.

**Caution:** Before servicing units covered by this service manual, read and follow the Safety Precautions section of this manual.

**Note:** If unforeseen circumstances create conflict between the following servicing precautions and any of the safety precautions, always follow the safety precautions.

## 1-2-1 General Servicing Precautions

1. Always unplug the unit's AC power cord from the AC power source and disconnect the DC Power Jack before attempting to:
   (a) remove or reinstall any component or assembly, (b) disconnect PCB plugs or connectors, (c) connect a test component in parallel with an electrolytic capacitor.
2. Some components are raised above the printed circuit board for safety. An insulation tube or tape is sometimes used. The internal wiring is sometimes clamped to prevent contact with thermally hot components. Reinstall all such elements to their original position.
3. After servicing, always check that the screws, components and wiring have been correctly reinstalled. Make sure that the area around the serviced part has not been damaged.
4. Check the insulation between the blades of the AC plug and accessible conductive parts (examples: metal panels, input terminals and earphone jacks).
5. Insulation Checking Procedure: Disconnect the power cord from the AC source and turn the power switch ON. Connect an insulation resistance meter (500 V) to the blades of the AC plug.

   The insulation resistance between each blade of the AC plug and accessible conductive parts (see above) should be greater than 1 megohm.
6. Always connect a test instrument's ground lead to the instrument chassis ground before connecting the positive lead; always remove the instrument's ground lead last.

# 1-3 Electrostatically Sensitive Devices (ESD) Precautions

Some semiconductor (solid state) devices can be easily damaged by static electricity. Such components are commonly called Electrostatically Sensitive Devices (ESD). Examples of typical ESD are integrated circuits and some field-effect transistors. The following techniques will reduce the incidence of component damage caused by static electricity.

1. Immediately before handling any semiconductor components or assemblies, drain the electrostatic charge from your body by touching a known earth ground. Alternatively, wear a discharging wrist-strap device. To avoid a shock hazard, be sure to remove the wrist strap before applying power to the monitor.
2. After removing an ESD-equipped assembly, place it on a conductive surface such as aluminum foil to prevent accumulation of an electrostatic charge.
3. Do not use freon-propelled chemicals. These can generate electrical charges sufficient to damage ESDs.
4. Use only a grounded-tip soldering iron to solder or desolder ESDs.
5. Use only an anti-static solder removal device. Some solder removal devices not classified as "anti-static" can generate electrical charges sufficient to damage ESDs.
6. Do not remove a replacement ESD from its protective package until you are ready to install it. Most replacement ESDs are packaged with leads that are electrically shorted together by conductive foam, aluminum foil or other conductive materials.
7. Immediately before removing the protective material from the leads of a replacement ESD, touch the protective material to the chassis or circuit assembly into which the device will be installed.

   **Caution:** Be sure no power is applied to the chassis or circuit and observe all other safety precautions.
8. Minimize body motions when handling unpackaged replacement ESDs. Motions such as brushing clothes together, or lifting your foot from a carpeted floor can generate enough static electricity to damage an ESD.

## 1-4 Installation Precautions

1. For safety reasons, more than two people are required for carrying the product.

2. Keep the power cord away from any heat emitting devices, as a melted covering may cause fire or electric shock.

3. Do not place the product in areas with poor ventilation such as a bookshelf or closet. The increased internal temperature may cause fire.

4. Bend the external antenna cable when connecting it to the product. This is a measure to protect it from being exposed to moisture. Otherwise, it may cause a fire or electric shock.

5. Make sure to turn the power off and unplug the power cord from the outlet before repositioning the product. Also check the antenna cable or the external connectors if they are fully unplugged. Damage to the cord may cause fire or electric shock.

6. Keep the antenna far away from any high-voltage cables and install it firmly. Contact with the highvoltage cable or the antenna falling over may cause fire or electric shock.

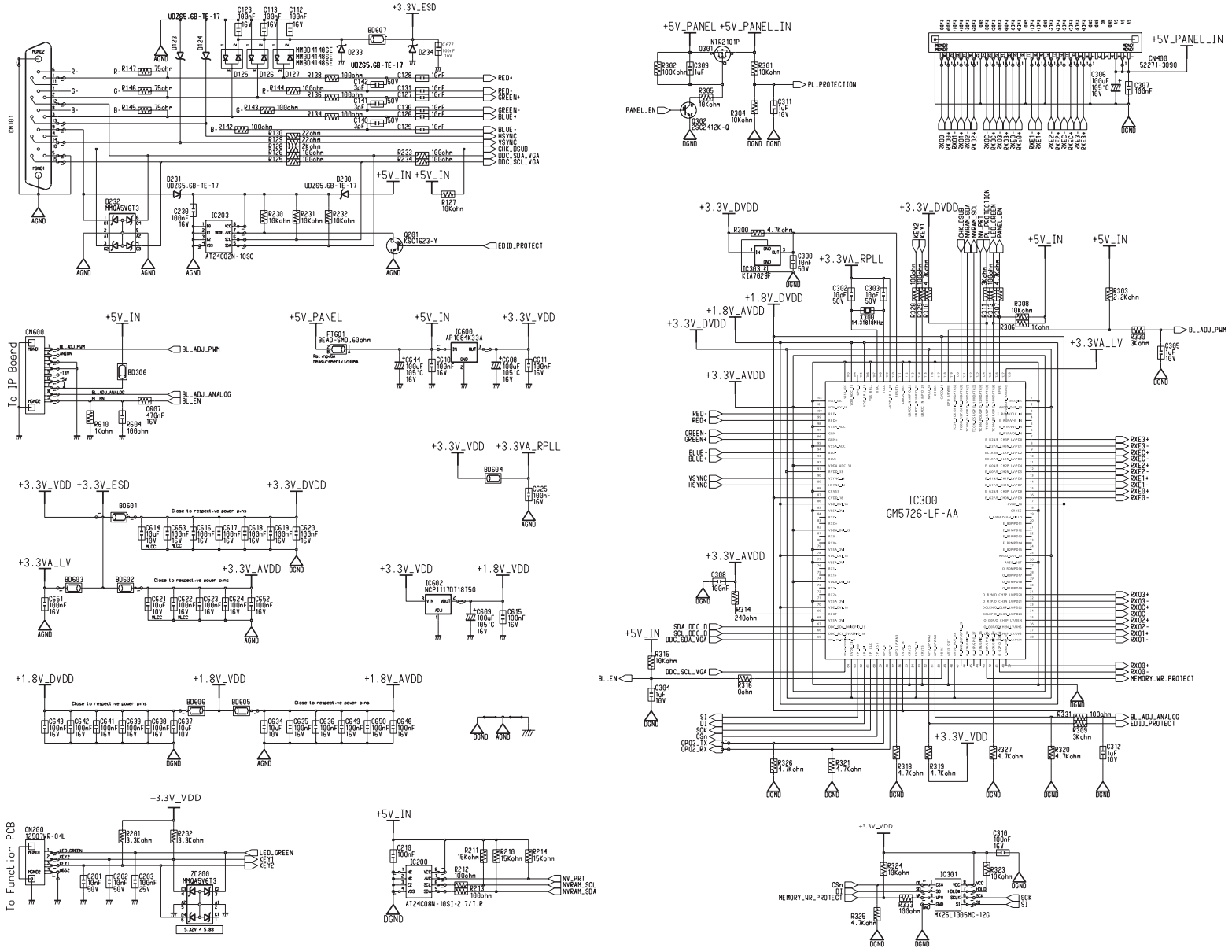
7. When installing the product, leave enough space (10cm) between the product and the wall for ventilation purposes.
   A rise in temperature within the product may cause fire.

# Memo

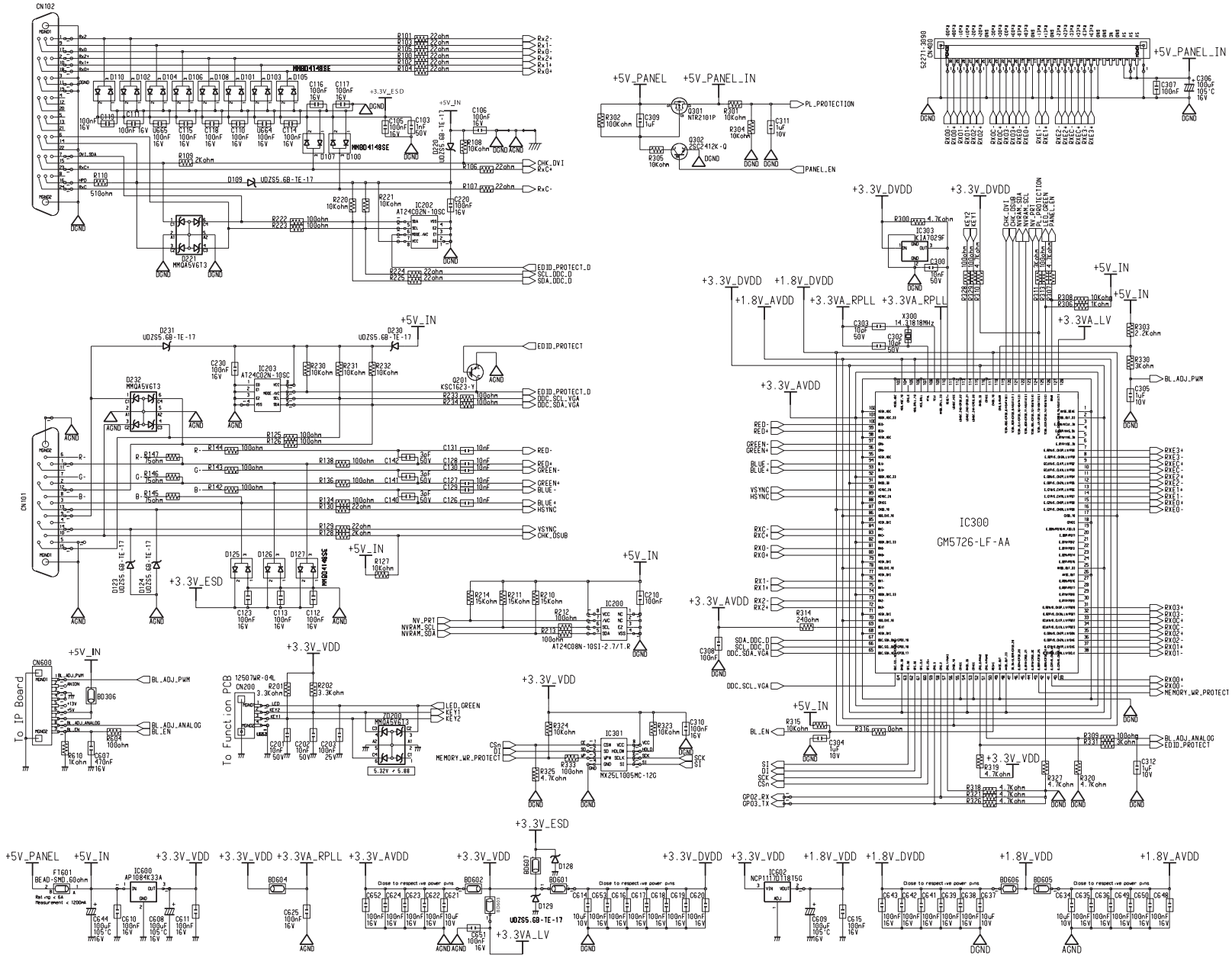
# 9 Schematic Diagrams

## 9-1 Schematic Diagrams (LS17PEA, LS19PEA)

- This Document can not be used without Samsung s authorization.

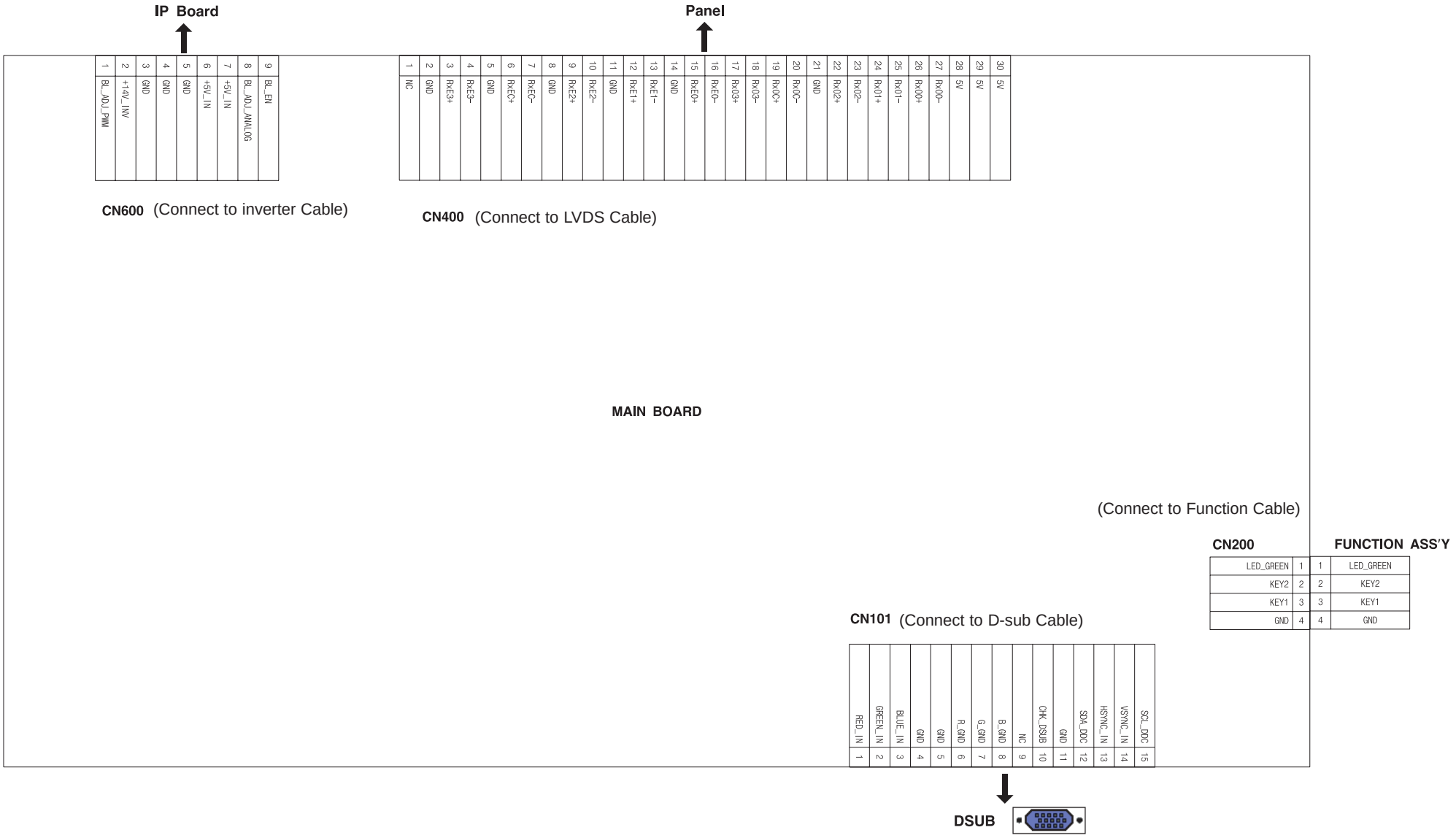


# 9-2 Schematic Diagrams (LS19PEB)

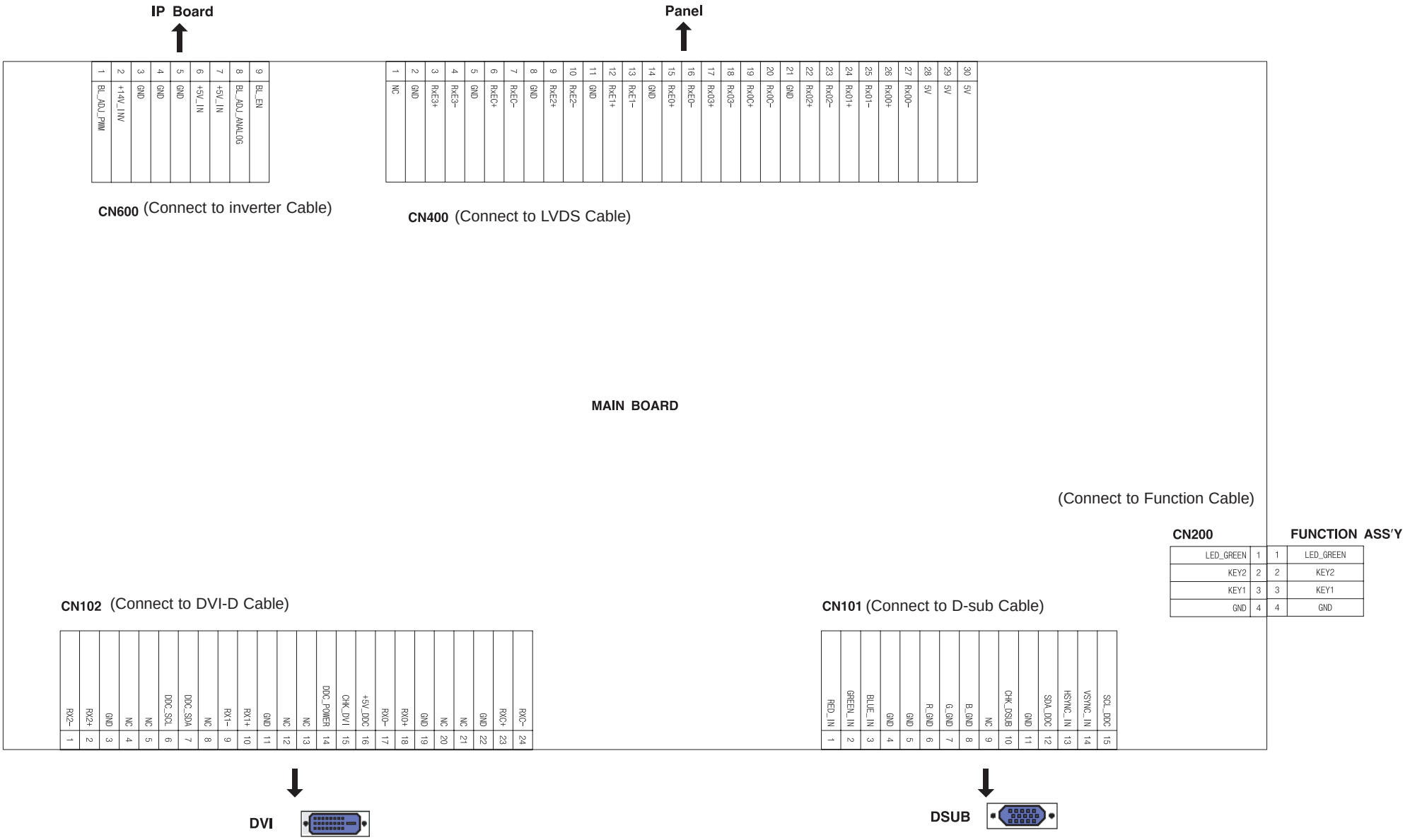


# 8 Wiring Diagram

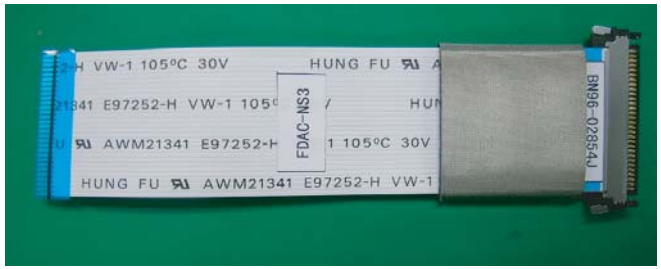
## 8-1 Wiring Diagram (LS17PEA, LS19PEA)



# 8-2 Wiring Diagram (LS19PEB)

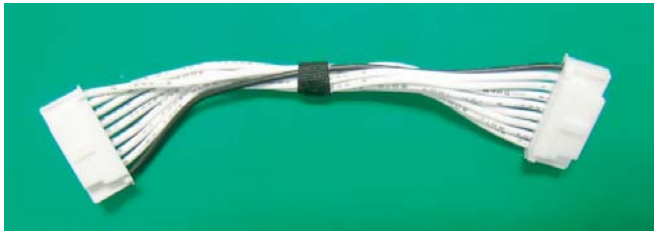


## 8-3 Wiring Diagram (Code No.)




17" LVDS cable: BN96-02854J

19" LVDS cable: BN96-02854H

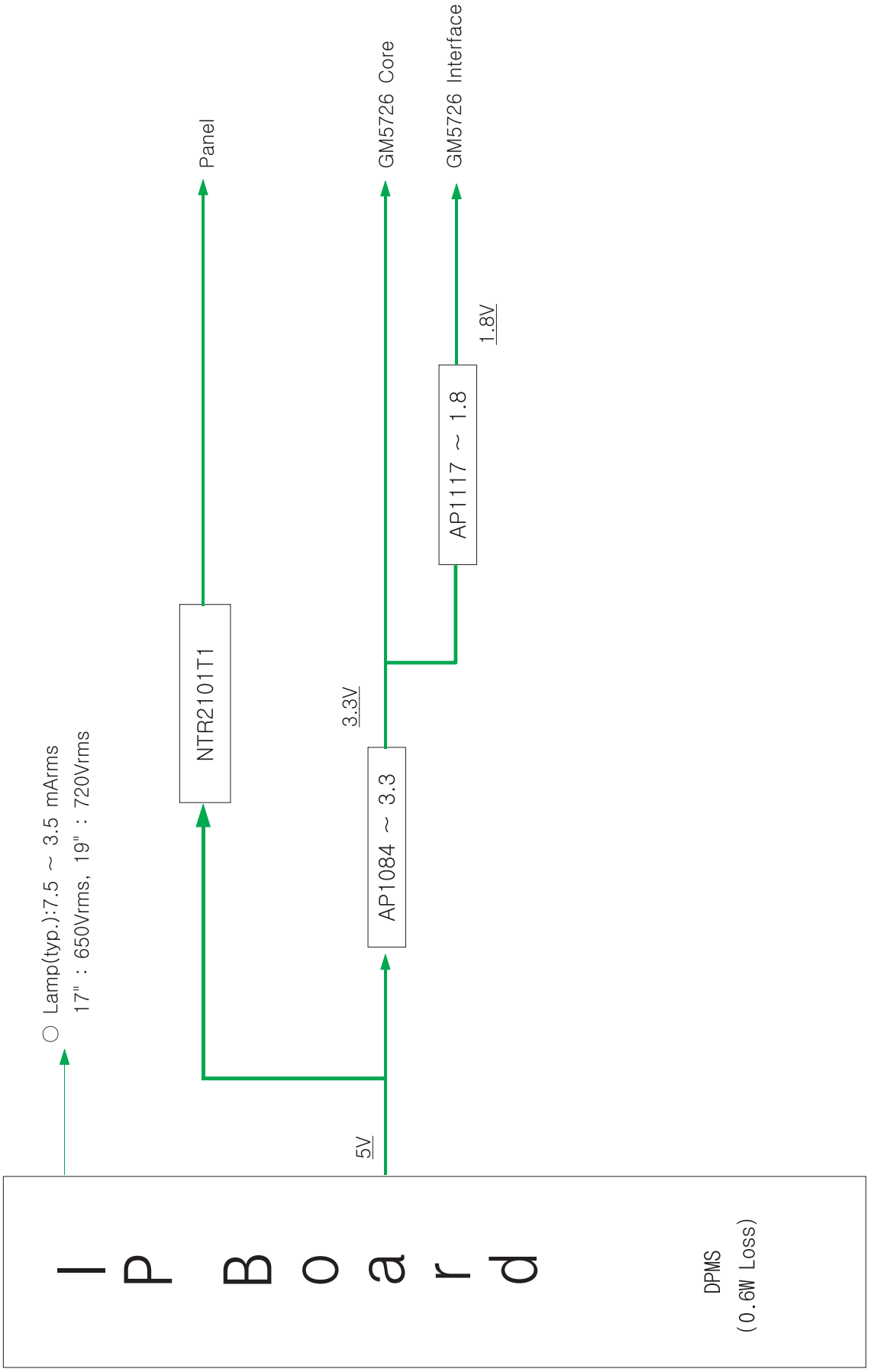


IP board - Main PBA Cable: BP39-00028A

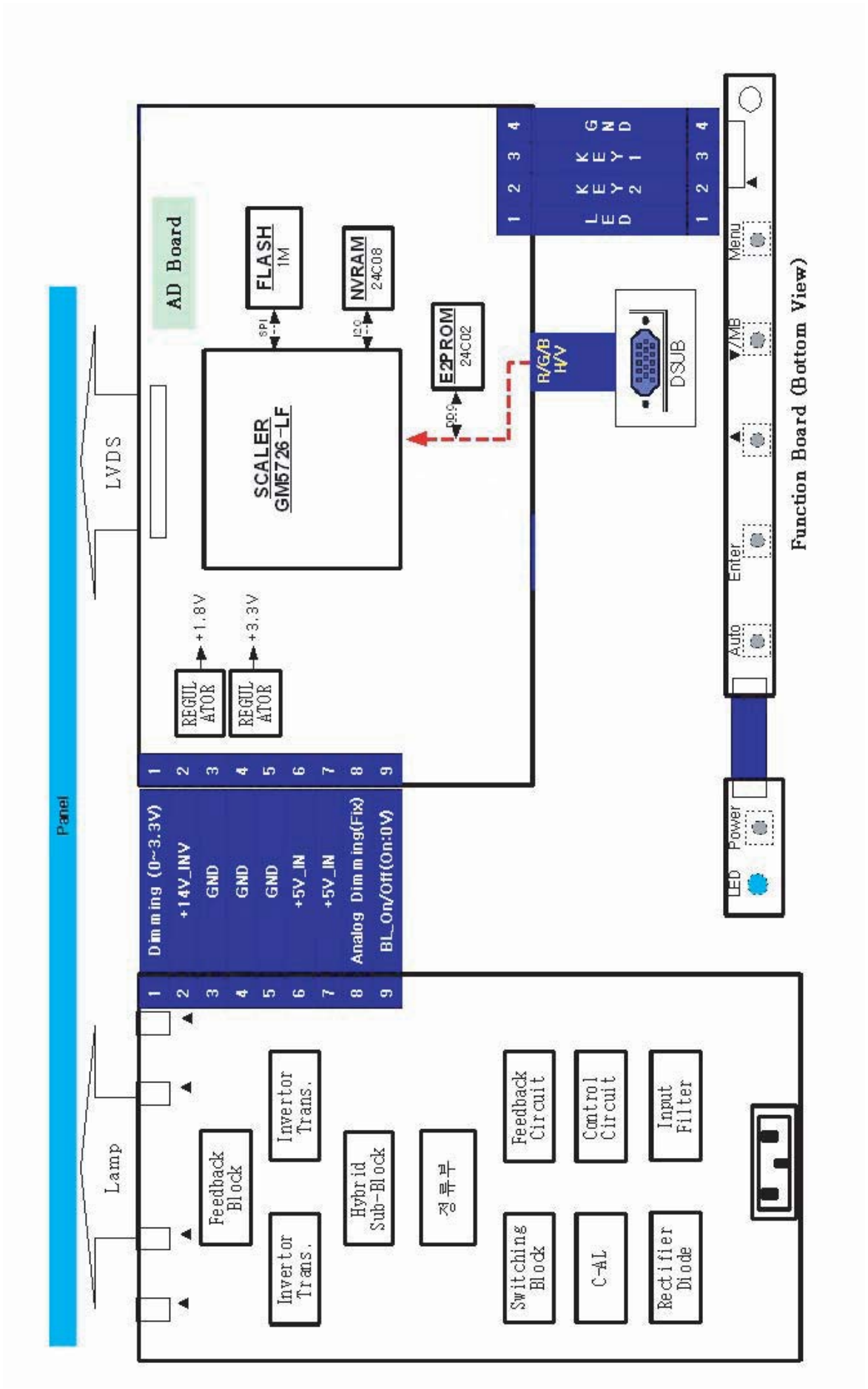
Memo

# 7 Block Diagram

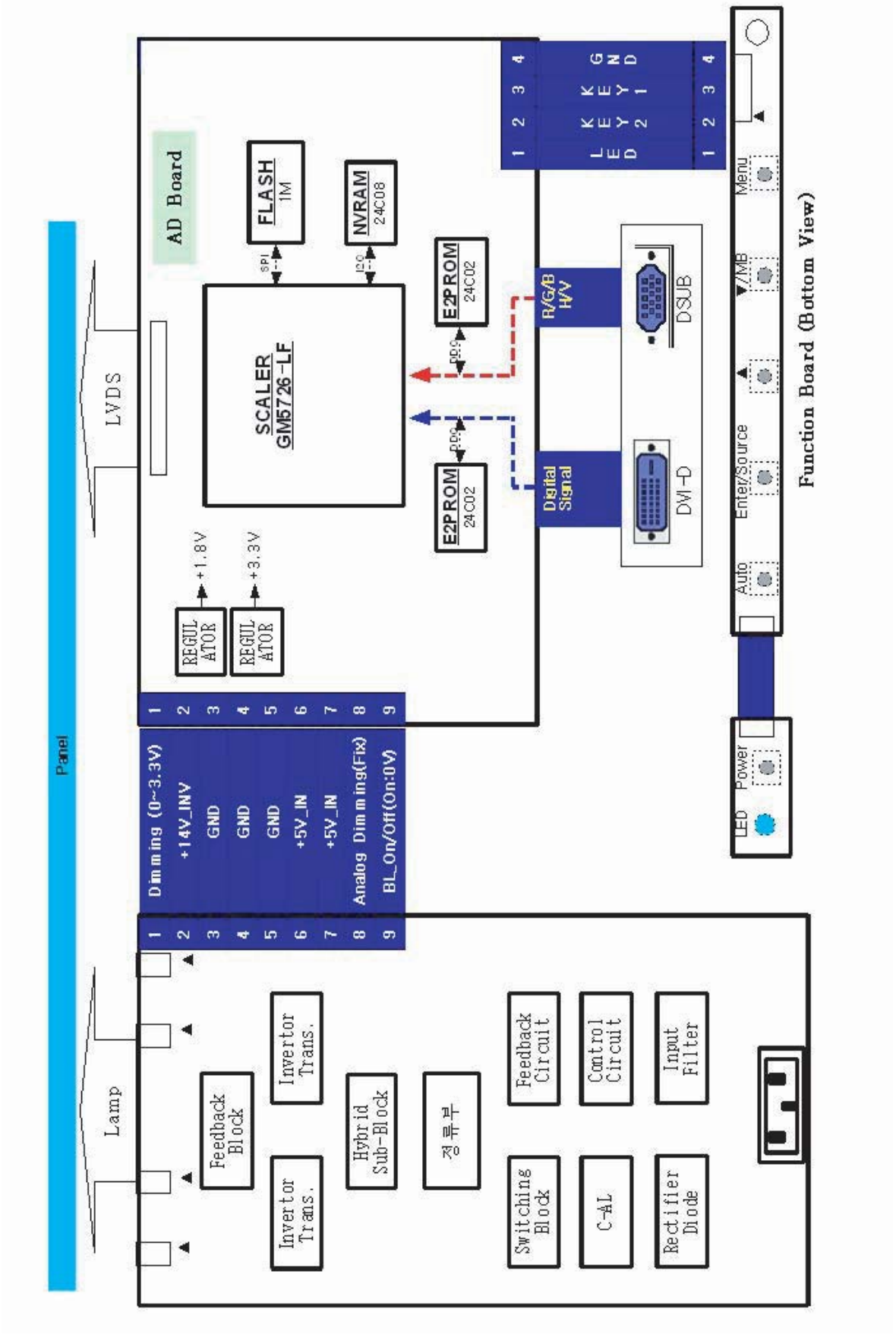
## 7-1 Power Tree



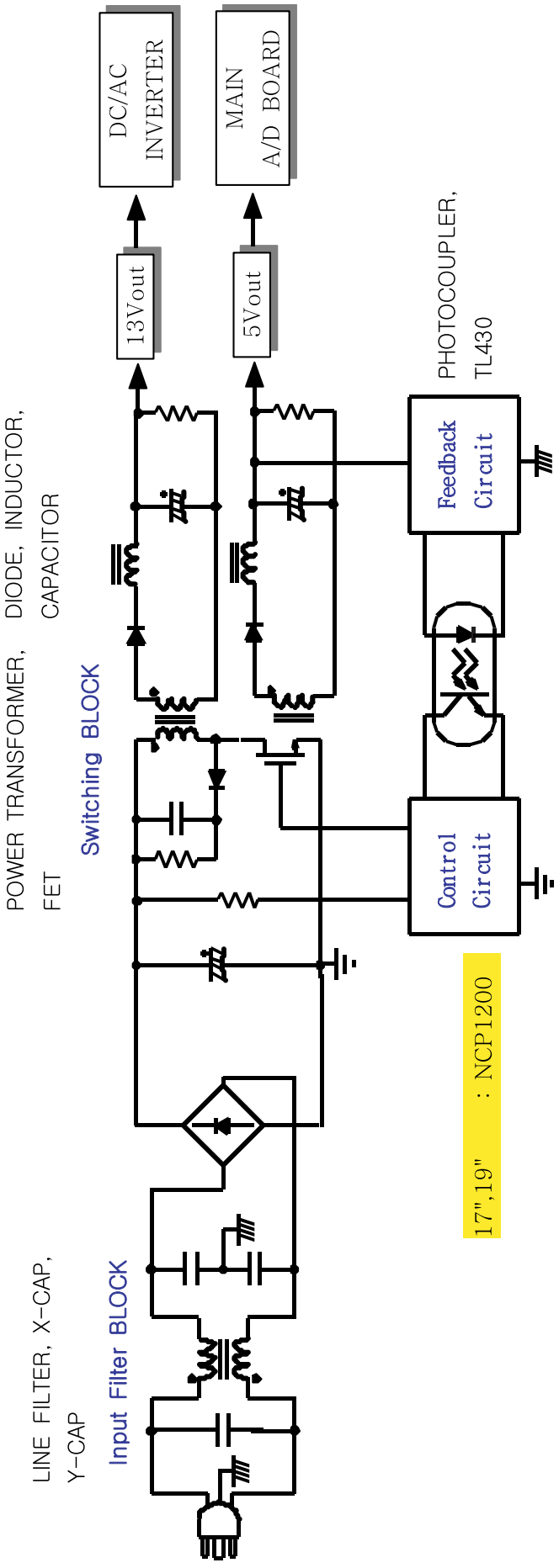
# 7-2 Main Board Part (LS17PEA, LS19PEA)



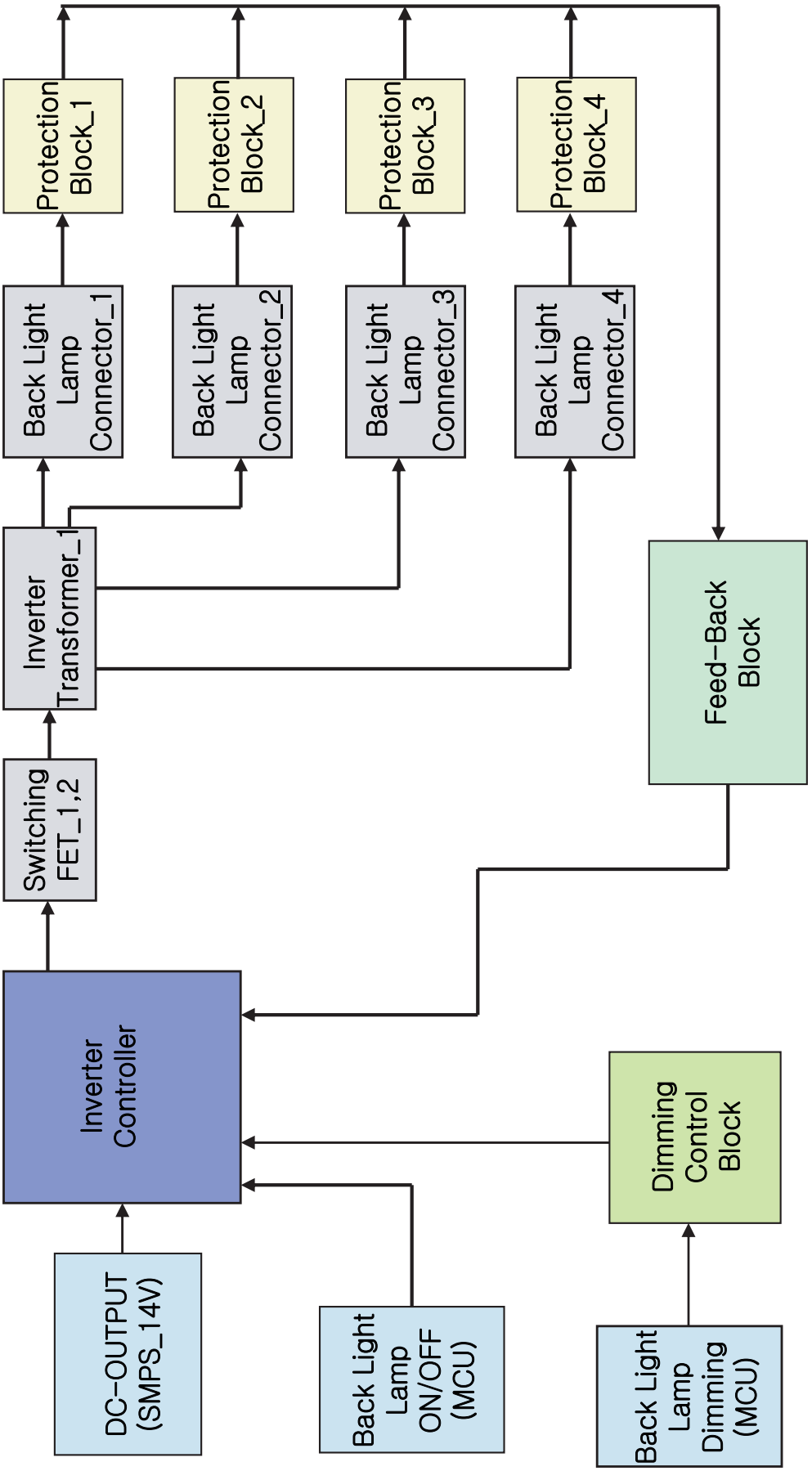
# 7-3 Main Board Part (LS19PEB)



# 7-4 IP Board Part (SMPS Part)



## 7-5 IP Board Part (Inverter Part)



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